DOCUMENT RESUME

ED 244 958 SP 024 825

TITLE The 1980 National Outdoor Recreation Trends Symposium. Proceedings (Durham, New Hampshire, April 20-23, 1980). Volume II. General Technical Report NE-57.

INSTITUTION Forest Service (DOA), Upper Darby, Pa. Northeastern Forest Experiment Station.

PUB DATE Apr 80

NOTE 218p.; For Volume I of the Proceedings, see SP 024 798.

PUB TYPE Collected Works - Conference Proceedings (021) -- Reports - Research/Technical (143) -- Information Analyses (070)

EDRS PRICE MF01/PC09 Plus Postage.

DESCRIPTORS Data Analysis; Futures (of Society); Industry; *Outdoor Activities; Public Support; *Recreation; Recreationists; Recreation Legislation; *Research Methodology; *Research Utilization; Social Indicators; *Trend Analysis

IDENTIFIERS *Outdoor Recreation

ABSTRACT

This publication, volume 2 of 2, contains proceedings from a national symposium on recreation trends. Topics of the 28 papers in this volume include: industry sources of trend data, applied trend research, the use of trend data for planning, and trend measurement. Papers are arranged in seven sections: (1) Keynote Session; (2) Trends in Policy and Influence; (3) Trend Measurement Methodologies; (4) Trend Data for Recreation Planning; (5) Applied Trend Research; (6) Industry Sources of Trend Data; and (7) Recreation Trends--A Future Look. (JMK)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED244958

PROCEEDINGS

1980 National Outdoor Recreation Trends Symposium

Volume II

U.S. Department of Agriculture, Forest Service
Northeastern Forest Experiment Station
370 Reed Road, Broomall, PA 19008

Sponsored by:

Northeast Agricultural Experiment Stations, NE-100

USDA Forest Service

USDI Heritage Conservation and Recreation Service

Recreation Working Group, Society of American Foresters

University of New Hampshire, Recreation and Parks Program

In cooperation with:

Clemson University

Journal of Leisure Research

Purdue University

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

USDA, Forest Service — General Technical Report NE–57

SP 024825

FOREWORD

Volume II of these proceedings contains a wide selection of papers presented at the 1980 Outdoor Recreation Trends Symposium. It includes, in addition to papers not available for Volume I, those papers presented during the keynote session, concurrent sessions, evening sessions, and the closing session. Concurrent session papers are clustered around four topics: Trend Measurement Methodologies; Trend Data for Recreation Planning; Industry Sources of Trend Data; and Applied Trend Research.

The closing-session papers provide considerable food for thought about future directions in outdoor recreation trend research. These two papers provide a balance between the need for trend measurement for professional purposes and in the limitations of trend measurement as a means for monitoring social change.

Throughout these proceedings it has been our purpose to promote, provoke, stimulate and, we hope, encourage the establishment of new and better data systems to monitor activity effectively in all sectors of outdoor recreation. We took this approach knowing there are certain inherent risks; not having an abundance of reliable trend indicators is often a politically expedient way of conducting the public's business in outdoor recreation. During an evening session in the course of the symposium, a small group of participants chose to speculate on just what some of the risks might be if we were suddenly faced with a world where all of the necessary trend measurement systems were in place. The consensus was that a number of undesirable reactions could be readily predicted: rejection --or challenging the data because of inconsistencies and a lack of representivity; procrastination--a paralysis of programs while decision makers await the latest in a series of data; prostitution--the use of data to justify more public programs rather than use it for better planning; sanctification--the establishment and growth of specialized elite decision makers to monitor an increasing array of potentially relevant phenomena; and routinization--the complete reliance on data resulting in the disappearance of a risk-taking attitude on the part of those who are paid to make difficult decisions.

The positive aspects, we firmly believe, of better data, better planning, and better decisions easily outweigh all of these risks. But the risks are there, and as we move inevitably in the direction of greater government accountability, we need to be constantly alert to their emergence.

WILBUR F. LaPAGE, Chairman
Program Committee

BEST COPY AVAILABLE

THE 1980 NATIONAL

OUTDOOR RECREATION TRENDS SYMPOSIUM

Held at the New England Center for Continuing Education
University of New Hampshire
Durham, New Hampshire
April 20-23, 1980

SPONSORED BY

Northeast Agricultural Experiment Stations, Project NE-100

USDA Forest Service, Northeastern Forest Experiment Station

USDI, Heritage Conservation and Recreation Service

Society of American Foresters, Recreation Working Group

University of New Hampshire, Recreation and Parks Program

PROGRAM COMMITTEE --

Wilbur F. LaPage
Malcolm I. Bevins
Robert D. Greenleaf
Floyd L. Newby
Gerald L. Cole
A. Robert Koch
Herbert E. Echelberger
Douglas M. Knudson

CONCURRENT SESSIONS --

Floyd L. Newby
Herbert E. Echelberger
Douglas M. Knudson
Kenneth J. Hock
Marvin W. Kottke
Mahmood Seyala

ADVISORS --

R. Duane Lloyd
Earl Patric
Basil J. F. Mott
Roland Robinson
Meg Maguire
Robert McLellan
Barry Tindall
Hugo John
Fred Knight

LOCAL ARRANGEMENTS --

Robert D. Greenleaf
Herbert E. Echelberger
Gus C. Zaso
Lawrence A. Rondeau
Patricia C. Merrill

COOPERATORS

Clemson University, Department of Recreation and Park Administration

Journal of Leisure Research, NRPA

Purdue University, Department of Forestry and Natural Resources

CONTENTS

KEYNOTE SESSION

New Hampshire--an outdoor recreation trend trend leader

George T. Hamilton 1

Recreation trends: Indicators of environmental quality

Roy Feuchter 7

Converging social trends--emerging outdoor recreation issues

Carl H. Reidel 9

TRENDS IN POLICY AND INFLUENCE

Trends in outdoor recreation legislation

George H. Siehl 15

Trends in organizational memberships and lobbying

William R. Burch (Vol. 1)

Land management policy and program trends

Darrell E. Lewis 19

The U.S. Army Corps of Engineers recreation resource management challenges

Gerald T. Purvis 21

TREND MEASUREMENT METHODOLOGIES

A methodology for the systematic collection, storage, and retrieval of trend data for the U.S. Army Engineers recreation program

Dennis B. Propst and Robert V. Abbey.. 25

Forecasting trends in outdoor recreation activities on a multi-state basis

Vincent A. Scardino, Josef Schwalbe, and Marianne Beauregard 35

A simulation model for forecasting downhill ski participation

Daniel J. Stynes and Daniel M. Spotts 55

The dynamics of recreation participation: ski touring in Minnesota

Timothy B. Knopp, G. Ballman, and L. C. Merriam 69

Trends in the temporal distribution of park use

Robert E. Manning and Paula L. Cormier 81

Network analysis: a new tool for resource managers

Ruth H. Allen 89

TREND DATA FOR RECREATION PLANNING

Outdoor recreation trend research: making the possible probable

Geoffrey Godbey 99

Trends in federal land acquisition, protection strategies, and planning

Warren Brown 103

Social-psychological implications for recreation resource planning

Hardeep S. Bhullar, Alan R. Everson, and Scout L. Gunn 109

Automatic, time-interval traffic counts for recreation area management planning

D. L. Erickson, C. J. Liu, and H. K. Cordell 115

Cross-country skiing trend data: planning for participant needs

Floyd L. Newby and William D. Lilley 125

A possible railroad-oriented scenario in Potomac River Basin planning

George H. Siehl 135

APPLIED TREND RESEARCH

Changes in recreation-oriented travel in the northeast between 1972 and 1977

Gerald L. Cole 139

Trends in Allagash wilderness waterway uses in the 1970's

Thomas J. Cieslinski 147

Assessing changes in the importance of tourism in the northeast

Tommy L. Brown 151

A method for explaining trends in river recreation demand

George L. Peterson, David W. Lime, and Dorothy H. Anderson 161

Trends in recreational vehicle traffic in northeastern Minnesota

Arthur Norton, Karen Noyce, and Thomas J. Wood 171

INDUSTRY SOURCES OF TREND DATA

Snowmobiling in the 1980's: continued progress for a mature recreational activity

William T. Jobe, Jr. 177

Woodall Publishing Company, an important industry source of camping information

Curtis Fuller, Paul Foght, and Linda Profaizer 181

Industry sources of trend data--skiing

William F. Malcolm, Jr. 193

Trends in participation sports during the decade of the 70's

Robert J. Halstenrud 195

RECREATION TRENDS--A FUTURE LOOK

Recreation trends--a future look "So what?--implications for the recreation profession"

Roger A. Lancaster 203

Outdoor recreation trends in the 1980's "So what?--implications for society"

Carlton S. Van Doren 207

REGISTRANTS 215

NEW HAMPSHIRE - AN OUTDOOR RECREATION TREND LEADER[1]

George T. Hamilton[2]

It seems appropriate (at least to me) that a national symposium focusing on trends in outdoor recreation be held in the Granite State; a state which has played historically a role in the evolution of a variety of recreation activities far out of proportion to its size and population. After all, outdoor recreation is more than 150 years old here in New Hampshire. Yet should I ask you to consider the field of outdoor recreation in a national perspective, I suspect that most of you would think of a great variety of people, places, activities, agencies and organizations far removed from the State of New Hampshire. In terms of history, you might think of the states of California and New York, of the Niagara Falls Reservation and the Catskill and Adirondack Parks, of the National Park Service and Sequoia and Yellowstone, of Stephen Mather and Frederick Law Olmstead and many others. In terms of activities, you might consider boating in Florida, surfing in Hawaii, wilderness travel in Alaska, dune buggies in California, scuba diving on the Gulf Coast and hang gliding in the Rockies or mountaineering in Washington State, (or perhaps volcano watching.) With an exception or two, we have all those activities here in New Hampshire as well, along with many others.

The phrase "outdoor recreation" has not been in common usage for very long, relatively speaking. And, there has been considerable debate and speculation as to its precise definition. We never really used the term widely until the Outdoor Recreation Resources Review Commission Report brought the term forcefully to the public consciousness upon its release in 1962. In his essay "Conservation Ethic" from his book, A Sand County Almanac, Aldo Leopold discussed the complexities of defining outdoor recreation:

> "Barring love and war, few enterprises are undertaken with such abandon, or by such diverse individuals, or with so paradoxical a mixture of appetite and altruism, as that group of avocations known as outdoor recreation".

He went on to say that,

> "Recreation, however, is not the outdoors, but our reaction to it".

Well, no matter how we define it, it appears that outdoor recreation is here to stay. Here in New Hampshire we understand what Aldo Leopold is saying for we have been in this business for a long time. We have seen recreationists, or tourists, in all shapes and sizes engaging in a myriad of activities. We have fished them out of the water, located them in the deep woods, plucked them off cliffs, and carried them off the mountains. Yet tens of thousands have come year 'round for a century and a half in perfect safety in spite of themselves.

BACKGROUND - HISTORICAL NEW HAMPSHIRE

It might be helpful to take a brief look at New Hampshire's colorful history first in order to establish a background for understanding the origins and evolution of outdoor recreation in this state. Scarcely 9,300 square miles in size, it is one of the nation's smallest states, yet it is endowed with such a variety of natural beauty that it has attracted visitors from far and wide since its earliest days of existence. It enjoys a lovely, albeit limited, coastline of about 18 miles in length. The Canadian Border lies northerly about 200 miles away. One can drive across its widest point between the states of Maine and Vermont in approximately two hours. Overall lies a wealth of hills and mountains, ponds and lakes, fields and forests. As our favorite poet, Robert Frost, said in his poem "New Hampshire":

> "----Just specimens is all New Hampshire has,
> One each of everything as in a showcase
> Which naturally she doesn't care to sell----".

From sea level to the summit of Mt. Washington, our state does offer, indeed, something for almost all tastes in terms of natural attractions.

EARLY SETTLEMENT

First settled in 1623 and briefly established as an independent province, then governed by the Massachusetts Bay Colony until 1741 when it became a separate royal province once again, New Hampshire has a long and glorious history, fascinating to

---

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980

[2]President, The Bank, 116 N. Main Street, Concord, NH 03301.

scholars and lay people alike. Time does not allow an in-depth review, obviously, but let us take a quick look at the evolution of the state.

The first settlers found a land heavily forested. Along the coastline were huge pine trees which, along with fishing, provided the colonists with their first industry; that of cutting the huge trees and shipping them to England to be used as masts for British merchantmen and men-o'-war. These trees ranged from 150 to 200 feet in length and were from three to six feet wide at the butt end. For more than a century, New Hampshire colonists worked at this trade until the large trees were gone and the British then looked to the Province of Maine as a source of masts.

The Colonists slowly pushed inland and settled further and further from the coast. Soon after the early settlers landed, some enterprising adventurers explored the interior reaches of the area; in fact one Darby Field, accompanied by two Indian guides, followed the banks of the Saco River to the Conway intervales and ascended Mt. Washington in 1642 -- my wife, incidentally, is a direct descendent of Darby Field. But in general, the settlers were slow to proceed into the northernmost reaches of the state because of the danger from Indians during the French and Indian Wars. It wasn't until after the Revolutionary War that settlement north of the White Mountains proceeded steadily. The famous raid by Rogers Rangers against the St. Francis Indian Village in Quebec in 1759 virtually eliminated the threat of raids by the Abnakis. Sadly, the Abnakis were virtually wiped out. They were one of several tribes of the Algonquin Nation which inhabited this area. Many of their colorful names linger on since many New Hampshire locations, rivers, lakes, and mountains bear names from their language, to wit: Piscataqua, Pemigewasset, Androscoggin, Ammonoosuc, Contoocook, Coos, Winnepesaukee, Kanasatka, Waukewan, Winnesquam, Wonalancet ---.

However, during the Revolution the threat of Indian raids into northern New Hampshire became real once again, when the fierce Mohawks of the Iroquois Nation sallied into the upper reaches of the Connecticut River Valley at the behest of the British.

Following the Revolution, towns and villages were developed all the way to the Canadian Border, although it was not until the Webster-Ashburton Treaty of 1842 that New Hampshire's border with the Province of Quebec was firmly established.

OUTDOOR RECREATION, ORIGINS

Even before New Hampshire's northernmost boundary was settled, newcomers were settling in ever-increasing numbers; some from states to the south and some from other countries. As roads were constructed and railroads extended throughout the state, visitors began to appear.

Before the Revolution, circa 1769, Provincial Governor John Wentworth became enamoured with the lovely scenery around Wolfeboro and built an extensive set of buildings overlooking the shores of Lake Wentworth, thus giving the town grounds for her slogan, "Wolfeboro, Oldest Resort Town in America". In a very real sense this could be called the beginning of summer resorts and vacation travel. I suspect that after riding in a carriage from Portsmouth to Wolfeboro over a rough, dusty and very primitive roadway, one would need a vacation!

Many English and American poets and artists during the period 1825 to 1850 discovered the scenic beauties of the state, and through their works spread the word far afield. Soon visitors began to appear in large numbers. Improved roads and an extensive railroad system saw resorts spring up all over the state. Hotels were quickly built during the 20-year period prior to the Civil War; soon after the War came the era of the Grand Hotel. These imposing structures brought visitors via carriage and railroad while management served lavish meals, and catered to every whim of their guests. Along with tourists came new activities for out-of-door enjoyment; hunting, fishing, horseback riding, sightseeing, boating, hiking, and later mountaineering -- all became popular. An extensive system of summer resorts along the coastline, in the various lake regions, and around the White Mountains was clearly established. Tourism continued to grow and to flourish all through the years with only brief periods of retrenchment during times of national crisis, such as the Great Depression and World War II.

One activity in particular New Hampshire can point to as an early trend leader is hiking. Earlier we noted Darby Field's first ascent of Mt. Washington in 1642. That unusual exploit (for the times) can scarcely be singled out as the beginning of hiking as a recreational activity in New Hampshire. That distinction lies in the completion of the Crawford Path from Crawford Notch to the summit of Mt. Washington in 1820 by Ethan Allen Crawford; today that trail is distinguished as the oldest continually-used foot trail in the Nation.

In 1876 the Appalachian Mountain Club was organized in Boston and promptly focused many of its acitvities in New Hampshire where many of its members built footpaths in the White Mountains. In 1888 the Club built its first mountain hut at Madison Springs, the forerunner of the hut system, which today numbers eight units plus an extensive headquarters in Pinkham Notch which is open year 'round to the public. Through efforts of the AMC, the U.S. Forest Service, and other groups, New Hampshire has established the greatest concentration of hiking

trails in the Country, a system which has been in existence since the mid 1930's. Today, hiking remains as one of the most popular outdoor recreation activities in the state with visitors coming from far and wide to enjoy this sport. Greatest concentration is on the White Mountain National Forest, as you would expect, one of the most heavily used forests in terms of recreational use nationwide.

CHRONOLOGY

Since time is limited, rather than expound at length about the chronology of various activities in detail, let me run through a list of landmark events in New Hampshire outdoor recreation with brief comments wherever appropriate:

1642 - First ascent of Mt. Washington, Darby Field

1769 - First summer resort, Governor John Wentworth built summer home in Wolfeboro

1820 - Crawford Path completed by Ethan Allen Crawford, oldest continually used trail in Nation

1853 - Construction of Tip Top House at the summit of Mt. Washington

1861 - Mt. Washington Carriage Road completed

1869 - Mt. Washington Cog Railroad completed

1888 - Madison Hut constructed at elevation 4,825', Madison-Adams Col

1901 - Society for the Protection of New Hampshire Forests organized; active through the years in contributing to public enjoyment of the outdoors

1909 - First Collegiate outing club; Dartmouth Outing Club organized

1911 - Weeks Act; permitted the creation of national forests east of the Mississippi River and White Mountain National Forest the first to be established.

1922 - Appalachian Trail efforts began; Benton MacKaye; New Hampshire trails instant part of Appalachian Trail

1931 - First ski school in United States at Pecketts-on-Sugar-Hill

1932 - First National Downhill Ski Championship held; at Mt. Moosilauke under the auspices of Dartmouth Outing Club at Ravine Lodge

- Completion of AMC Hut System; until Mizpah Hut in 1964, first and only Mountain Hut System in Nation

1933 - First National Intercollegiate Downhill Ski Championship, DOC at Mt. Moosilauke

1938 - First aerial passenger tramway in North America, Cannon Mtn., Franconia Notch State Park

- First major ski area in a state park system

1939 - First Inferno Race, Mt. Washington, won by Austrian Toni Matt in race from summit of Mt. Washington to Pinkham Notch - 4 miles - times still a record, 6 minutes, 29 seconds

1945 - Division of State Parks established as independent unit; broken away from Forestry Commission

1948 - Mt. Sunapee State Park established; second major ski area in state park system

1960 - First Private Campground Owners Association in Nation; evolved through instigation of state, co-produced Camping Guide for 20 years

1962 - First Private Campground Association to have a full-time executive director; promoted tourism; produced major camping show

1969 - Among leaders in dealing with snowmobile problems; first to lease private lands for public trails; liability insurance

MODERN ERA

This brings us to the so-called modern era which begins with the great outdoor recreation explosion of the early 1960's. (My definition). The Outdoor Recreation Resources Review Commission (ORRRC) Report had outlined for the Nation the trends and needs at local, state, and federal levels. Fortunately, many public and private organizations were already preparing for improved and expanded facilities at about the same time. Here in New Hampshire three agencies in particular were in the process of planning and constructing a variety of new facilities and services for the public; they were the U.S. Forest Service, the Division of State Parks, and the Appalachian

Mountain Club. Indeed, they have been in the forefront of trend setting in dealing with present and anticipated recreational problems.

The Forest Service instituted long range recreation planning while initiating construction of new campgrounds, picnic areas, back-country camping facilities, and so on. The Parks System had guided a recreation bond issue throughout the Legislature in 1961 and in the ensuing years built several new parks and improved facilities in general. The AMC began an ambitious program of improvement throughout the hut system and built a new facility on the side of Mt. Clinton named the Mizpah Hut. These agencies teamed up to institute many services and policies that could truly be called trend setting in the field of outdoor recreation. To list some of them:

White Mountain National Forest

- as one of the leading "recreation" forests in the Nation, the WMNF instituted comprehensive long-range planning with public involvement which gave great credence to all aspects of outdoor recreation through unit planning

- it took steps to protect scenic areas and unique natural resources on the Forest by imposing restrictions and controls

- it undertook a variety of research projects aimed at environmental impact and user behavior

- it has done a reasonably good job in achieving balance in terms of recreation and commercial needs between the "Wilderness" and "Multiple Use" controversy

Appalachian Mountain Club

- instituted guided hikes, alpine flower walks, etc. and found great public acceptance

- started mountain leadership workshops in order to improve leadership of guided groups, especially children's groups such as scouts, YMCA, church, and other groups

- initiated "carry in, carry out" program on WMNF which contributed greatly to cleaning up trails and campsites

- demonstrated that private organization can effectively help public sector meet needs of recreationists

- devised new trail maintenance and construction techniques that became model for other sections of the Country.

- hut system continued to be model for accommodating public in mountains with pluses and minuses in terms of environmental impact; experimented with different methods of dealing with these problems and worked closely with U.S. Forest Service and National Park Service

N.H. Division of State Parks

- historically park campgrounds were self-sufficient financially and charged more realistic prices than most others; first to charge differential rates; first to charge preferential rates based on site attractiveness

- demonstrated that state-operated ski areas could fulfill a need and not compete unfavorably with private areas

- held firm against intrusion of I-93 through Franconia Notch State Park; with aid of conservationists gained compromise which protected and improved park facilities and resources

To a great extent, the New Hampshire philosophy regarding the financing of park operations has been, "the user should pay", while at the same time the feeling was, and is, that capital projects which would benefit future users should be financed through general fund monies. Although this philosophy is now widely shared by other states, it has not always been so. In his book, The State Parks - Their Meaning in American Life, Freeman Tilden pointed out the following in 1962:

> "In New Hampshire - fortunately this is almost the only instance of it - successive legislatures have insisted that the state parks "pay their way". Nature provided this state with some of the most thrilling and satisfying scenery in the Country; it has never been a problem to find suitable natural areas that measure up to the most exacting criteria of the ideal state park. Yet, the insistence upon self-support has forced a director of ability and discrimination to resort to "attractions" that are obviously incompatible with the grandeur of the parks.
>
> To be fair, however, the reasons for this situation should be mentioned. New Hampshire was in the tourist business long before state parks were conceived. The same geological changes that made it, except for pockets of alluvium, a hardscrabble agricultural region endowed it with a beauty and significance that enabled it to count on income from visitors as a regular means of livelihood. Therefore, the feeling for state parks based upon cultural values - - - remained mostly in the imaginations of a few idealists".

We feel that New Hampshire has been a trend setter in terms of charging realistic rates for services rendered which would not put private operations offering similar services at a competitive disadvantage, while at the same time it has provided services which private enterprise has been either unable or unwilling to supply.

CONCLUSION

Today New Hampshire and the Nation face a most uncertain future. Many of our former guidelines, plans, policies, and services for outdoor recreation are archaic; perhaps even our philosophies as well. It is time for reevaluation; a time for sensitivity to the needs of our total constituency, a time for innovative thinking, and a time for commitment to dealing with an ever-changing society.

I feel confident that here in New Hampshire our institutions and our managers will continue to rise to the challenges of providing services and facilities in the field of outdoor recreation. We have the natural resources for it; we have a sound track record. In a sense New Hampshire has been a laboratory in this field, a microcosm of the national scene. I suspect we shall continue in some fashion to be a trend setter. The spirit of independence which we have inherited here has stood us in good stead. New Hampshire people have demonstrated resourcefulness and leadership when the need has arisen. As Robert Frost said:

> "When I left Massachusetts years ago between two days, the reason why I sought New Hampshire, not Connecticut, Rhode Island, New York, or Vermont was this: Where I was living then, New Hampshire offered the nearest boundary to escape across. I hadn't an illusion in my hand-bag about the people being better there than those I left behind. I thought they weren't. I thought they couldn't be. And yet they were ---".

RECREATION TRENDS: INDICATORS OF ENVIRONMENTAL QUALITY[1]

Roy Feuchter[2]

As you probably know, tomorrow is Earth Day-80, the 10th anniversary of the original Earth Day, so it is certainly appropriate that we talk these next few days about environmental quality and the relationship of outdoor recreation to that quality. However, perhaps the title should be more of a question such as: Are recreation trends indicators of environmental quality? Or do recreation trends follow environmental quality trends?

Maybe they should, but I think it is probably not so! For example, we have had many new environmental laws in the last decade, and much significant progress towards environmental improvement. But recreation trends haven't included a commensurate recognition of the importance of recreation, nor of an enhancement of the quality of the experience! In fact, the trends in outdoor recreation have been towards a reduction of the environmental quality! Overcrowding, reduced services, limited expansion of facilities and programs have all been leading to degradation of the social environment or quality of the recreation experience.

Further, recreation management has not been keeping up with the level of management we had attained 20 years ago! Our use is increasing rapidly, but I'm afraid that our management expertise is not! In addition, our clientele is changing and our response has been to react in terms of old norms rather than provide leadership to dampen or reverse the change. As a consequence, quality of experience is slipping.

In the past, we simply provided more opportunities and the quality of the experience went up because our users were either experienced or had backgrounds that allowed them to participate easily and fully. In the future as we continue to urbanize, we will probably have to teach people what is available, where it is, how to reach it, and how to participate--in addition to providing quality opportunities. And providing the opportunities will also be more difficult since there will be more people, more conflicts, more impacts, and probably relatively less resources to work with.

This leads me to conclude that we must do more in the future than we have in the past to influence the direction of future recreation trends. We need to establish some trends for management (Management trends) to insure that the pattern of future recreation trends will clearly indicate increased environmental quality rather than decrease it. As you move through this symposium, I hope you will keep that possibility in mind; and to help you with that, I will suggest some management trends that I feel are needed. Some of them are responses to trends you will be discussing here at the symposium. Others are efforts to influence our future trends.

Probably we all subscribe to the philosophy of improving the quality of the recreation experience. We subscribe, but we have had trouble producing the quality. What is needed are some better ways to manage for that quality. Coupling that with the obvious changes in clientele, or potential clientele, that can be foreseen, and the need to strengthen management, leads me to believe that the field of interpretation needs to be one of our management trends. It can help to improve the quality of the experience by helping users participate and by helping solve management problems, and by providing user-feedback systems which develop real ways of talking to users and measuring satisfaction and involving the public in our actions in educational ways. I would include here development of measures of how well we are meeting our goals, and also measures to identify factors that influence user participation.

Much of this kind of information could be of great value to the private sector as well as public suppliers of recreation, and this leads to another management trend. We must somehow involve the private sector more in the supply of natural resource-based outdoor recreation. Most public recreation administrators have offered this goal for years, but it appears to me that the trend doesn't predict fulfillment of that goal. For the most part, we are probably no further ahead than we were 20 years ago. Consequently we need to:

(a) Reduce public sector competition with the private suppliers of outdoor recreation opportunities. We in the public sector have been slow to fully consider the possibilities of pricing, location, and substitutability in relation to reducing competition.

---

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2]Director, Recreation Management, USDA Forest Service, Washington, D.C. 20250.

(b) Encourage more complete recreation packages for private sector operations while keeping in mind our goals for high quality experiences in natural resource-based outdoor recreation. An example here would be more summer use of winter sports sites, complete with interpretive programs.

(c) Help make private land more accessible. Basically, of course, it must be profitable or otherwise beneficial to the landowner. Consequently, we need more attention to tax incentives, to reduce liability, and again, to reduce competition from the public sector. We might also consider enabling legislation to provide more flexibility for public sector use of private professionals in design, inspection, and consulting.

We also need to develop a management trend towards more professionalism in our recreation managers. They need to make better use of what's gone before, and have a better knowledge of the techniques and aids that exist for management. They will also be learning more of what is happening in the profession and with users--and they will need to know more about why and how to influence it. And they will need to learn how to develop more economic analyses to determine cost-effectiveness--of dispersed recreation, for example.

Monitoring must be a management trend. It's a legal requirement now under many of the environmental laws. It's also going to be a necessity if we are to know whether we are, in fact, really providing those quality experiences. We will need to monitor user satisfaction and participation and demands, of course, but also we need to monitor professional performance, and we must learn to monitor or determine need as well as demand. Our ability to identify and monitor that difference will be a measure of our expertise as recreation professionals! We must, to some extent, be willing to make determinations of need and then influence trends by designing to meet those needs.

But probably the biggest management trend of all is the need to quantify the social (non-economic) values of natural resource-based outdoor recreation--or at least develop ways to demonstrate that value. I believe there is, in fact, a relationship between the quality of our outdoor recreation and environmental quality or the quality of life in America. But we need measures of that quality and that relationship, and measures of the value of that recreation. We must develop output measures that can be converted to targets so that we can demonstrate recreation's relative importance with the other renewable resources--and to allow us to manage for quality.

Now you may feel there are already adequate measures of value. Certainly the "willingness-to-pay" concept is one good way to develop value of recreation, but it can measure only that element of need that the user recognizes. That is, if we recognize the relationship of natural resource-based outdoor recreation to some of our social needs, then our willingness to pay for that recreation can establish a value. But often, in fact probably in the majority of cases, recreationists do not fully recognize such relationships. Consequently we recreation professionals must take the lead in identifying those relationships and in demonstrating the true value and importance of outdoor recreation to the American people.

We must identify that outdoor recreation can provide social values, and demonstrate that it offers alternatives to the pressures of urbanization, specialization, and modernization. During this symposium, you will be looking at trends in urbanization and the pressures they generate, and I imagine you'll be discussing possible changes that may take place in cities to reduce those pressures and to reduce the need to leave the cities temporarily to escape the pressures. And certainly fuel constraints may also influence the ability to go very far in search of natural resource-based outdoor recreation. But I expect that the need for such recreation--and in remote areas--will continue high during most of our careers.

So this brings me to my final management trend.

We have to think in terms of energy-efficient recreation and establish a management trend whereby we can help to make the more remote, rural, natural resource-based outdoor recreation opportunities more accessible to urban populations.

We will need:

- new and creative transportation planning,
- utilization and creation of new public transportation,
- coordinated vacation packages that involve many levels of suppliers, many of whom have historically not worked together, and
- innovative ways to make existing equipment or facilities more usable.

When we couple this with the interpretive efforts I spoke of earlier, we can make quality outdoor recreation opportunities available to urban residents including the special populations.

So in closing, I would encourage all of you to play a more active role in determining the future recreation trends so that they may indeed become indicators of environmental quality.

CONVERGING SOCIAL TRENDS--EMERGING OUTDOOR RECREATION ISSUES[1]

Carl H. Reidel[2]

I can't recall when I have attended a national conference with a more clearly defined objective than this one. We are here to document outdoor recreation trends and explore their meaning for the future. The word "trend" appears no less than 45 times in the conference brochure, and the symposium organizers are determined that the proceedings will be "the most comprehensive assessment of outdoor recreation trends ever compiled."

It is a timely objective. Competition for scarce public appropriations and limited private capital will require solid evidence if new programs are to be funded. As professionals we must be constantly attuned to changing trends and able to interpret their implications for the future--especially those of us concerned with the management of natural resources. A forester colleague of mine put it this way: (He was talking about professional foresters, but I believe it applies to all of us here.)

> Since our ultimate professional interest . . . is in management of our resources, our ultimate interest is in the shape of the future. For management is decision making, and decisions cannot be made about the past--or about the present, either. Only the future is subject to decision. The context of management lies in the future. (William A. Duerr)

Yet, knowing the truth of that statement, we know also that the future is increasingly difficult to foresee. Perhaps this is because of the speed with which we are approaching the future--a sort of professional "future shock." Perhaps it is because of our preoccupation with present crises and growing uncertainty about the likely outcomes--a loss of faith in the lessons of past experience. One might well define the current economic inflation as the price of hopelessness; the cost of uncertainty; the economic expression of our unwillingness to plan for a tomorrow that we cannot comprehend.

But, whatever the reasons, we are finding future-telling an increasingly difficult task. Even with vastly improved methods of electronic data analysis and sophisticated planning techniques unknown a decade ago, we are aware that something is lacking in our understanding of the world in which we live, especially in the realm of social phenomenon. I am not alone in this feeling of doubt about our skills in interpreting the future implication of social information.

In the Social Science Research Council's recent annual report, the Council's president, Kenneth Prewitt, admits that social scientists are feeling "a serious and widespread uneasiness" over their inability to provide "intelligible and plausible" explanations for a number of important social phenomena." He lists "stagflation, Johnny's inability to read, artistic creativity, the rise of new religious movements, the causes and conditions of happiness, and radically different rates of economic development," among others. He points out that, while social scientists have adopted quantitative methods in most of their research, rigorous measurement and modeling hasn't provided the depth of understanding expected. As a result, he sees the social sciences "groping toward the humanities" in an effort to find better explanations and new perspectives.

Though not terribly comforting, I think Mr. Prewitt has discovered what most of you have learned from experience as practicing professionals: that no matter how much data you have, or how sophisticated your analytical skills, good decisions cannot simply be computed. It takes something more. Good management is an art, as well as science. And the "art" is a blend of creativity and intuition--the insight to read trends without making them self-fulfilling prophecies; to understand that trend need not be destiny.

I am convinced that this understanding of decision making--and, thus, future telling--is especially important today. Change is coming too fast. Synergy and complexity are generating previously unknown social phenomena. Yesterday's data and last year's trends may, or may not,

---

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2]Director of the Environmental Program, and Daniel Clarke Sanders Professor of Environmental Studies, Professor of Forest Policy, University of Vermont. JOHN D. MEYERS, junior student in Environmental Studies, University of Vermont, contributed substantially to the ideas expressed in this address.

explain today's situation or tomorrow's prospects.

In saying this, you may wonder what I am doing here attempting to explain the meaning of social trends and emerging issues; to talk about a future for which I am suggesting that there may be very little reliable information on which to base forecasts. I should have had the good sense to heed Mark Twain's sage advice that it is "better to remain silent and appear stupid, than to open your mouth and remove all doubt." But, on the other hand, why not? Only time can prove me right or wrong.

All this may seem like a lengthy build-up to suggesting that I can't really address the advertised topic. It isn't! Rather, I want to encourage you to do what I will be trying to do in the next few minutes: to participate in this symposium using imagination as much as reason; to depend on intuition as much as analysis; and to trust your insight as well as your data. This is not to suggest that we should be less rigorous in our analyses of the trend information to be presented, or that we abandon our quantitative tools. What I am saying is that even more than our data processing skills, we must depend on our creative abilities as we seek to understand the future.

Enough preamble. Let me attempt some future telling, relying on both facts and fancy. These are ideas you've probably heard before. You may not agree. But I'm not seeking your agreement as much as I am your willingness to speculate with me--your willingness to explore some alternative futures.

A Future of Change

If there is one clear trend today, it is that change is a permanent characteristic of modern life. We are learning the meaning of exponential rates of change in all realms of society. The pace is quickening, and our sense of uncertainty about the future is growing.

We see growing alienation of individuals to systems of centralized decision making, and a steady weakening of traditional social values as our institutions lag in their ability to adapt to technological change. We are frustrated that even our rapidly expanding knowledge of the world in which we live only seems to create more uncertainty. Every new solution suggests even greater problems; today's breakthrough is tomorrow's crisis. In a few decades, the promises of DDT and nuclear power, of saccharin and interstate highways, of PCB's and urban renewal have somehow soured.

Future shock is as common as the common cold, and we have no reason to expect the rates of change in our society to slow down in the near future. The best we can do is to be flexible; to avoid building institutions and programs than cannot adapt to change.

But let me be more specific by focusing on a few changes that have special significance for outdoor recreation.

The Energy "Crisis"

No change has come upon us with such unexpected force than has the energy crisis. I will not burden you with the statistics that have become all too familiar in the past few years. Nor am I willing to debate the authenticity of this crisis, except to suggest that "crisis" is an inappropriate word to describe the present energy situation. The idea of a crisis infers the problem is severe, but passing. Nothing could be farther from reality. The "crisis" is already past. The situation is permanent. We will be living with reduced supplies and increasing prices for decades to come.

I doubt that I need to interpret the meaning of the energy situation for outdoor recreation. Pleasure driving and long-distance auto vacations will soon become genuine American Graffiti. I doubt, however, that Americans will simply stay home, jogging around the subdivision or playing tennis at the high school. But we'll surely shorten the range of our recreation trips. Recreation vehicles, energy-hungry boats and ORV's may not disappear, but it's clear they will not be the playthings of the average American.

With energy conservation the only realistic way to quickly reduce our reliance on imported oil, we must look forward to some profound changes in the way we live; certainly in the way we play. Whatever you may imagine about the future of outdoor recreation, it had better include some careful thinking about energy--thinking that cannot rely heavily on any past trends.

Changing Life Styles

But even if the energy situation hadn't changed so radically, I think we could still anticipate major revisions in the character of outdoor recreation in the United States. Our life styles are being reshaped by significant changes in demographic patterns and social values.

With the war babies moving into their thirties, our median age is rising toward a projected 35 years in 2000. With later marriage, lower birth rates, more frequent divorce, and rising social acceptance of unmarried women, single Americans will share power with the family in shaping recreation patterns. Coupled with increasing urbanization and restrained auto travel, pressures for expanded recreation opportunities in our major metropolitan areas will be immense. People will have more time off as work weeks shorten and, if current trends continue,

they will spend an increasing share of their incomes on leisure time activities; pushing demands on facilities even higher.

It's not my task to define the recreation pursuits this older, urban, often single American will seek, but the present trend toward active physical recreation seems likely to continue. Concern with personal physical health is evident everywhere: herds of joggers along the Potomac, nutrition charts and diet books at supermarket checkout counters, and relentless TV ads about active living as the road to happiness, sex, and self-fulfillment. It's difficult to sort out whether this new preoccupation with one's body is a reaction to our increasingly unhealthy environment, simply a new form of national vanity created by media hype that looking healthy is half the fun of disco, or something deeper.

Regardless of the reason, I think it's here to stay. And I think it's a deeper social change than we suspect--a change reflecting our new awareness of environmental quality, better health education, and some important shifts in our attitudes toward ourselves and our work.

The Emerging American Women

With increasing numbers of women entering the work force, and with barriers to their assuming roles previously reserved to men gradually eroding, we should see a shift in female recreation interests. Like men, interest in challenging and high risk sports will grow as women seek the psychological relief of such recreation from work pressures. Whether singles or family members, women will also have an increasing influence in deciding on group and family recreation patterns. Old patterns of weekend recreation, backyard sports, and summer vacations dictated by Dad and the kids will give way to shared decisions. In families where the woman's income represents a substantial increase in discretionary income, she will further influence changes in recreation patterns by providing economic resources for new activities.

On the negative side, the emerging role of American women as equal partners with men in work and play could mean a substantial decline in the numbers of volunteers working with recreation organizations. Women have played a significant role in many youth organizations and, unless men now begin to share these volunteer tasks, we can expect decreasing recreation opportunities for youth through these traditional groups.

Changing Work Ethics

Changes in national attitudes toward work and play will not be confined to women, however. Something is happening to our view of work in an even more profound way. We seem to be losing much of our earlier faith in the American Dream--that hard work will get you ahead; that one's work is the highest expression of freedom and choice in a democracy. Perhaps it is the heavy hand of inflation, coupled with the uncertainties of energy shortages and international tensions. Whatever the genesis, there is a growing sense that our freedom of opportunity--the chance to win a larger slice of the economic pie--is being constrained. If this is true, it has important implications for outdoor recreation.

While recreation was once considered a luxury or, at best, an earned respite from work, it is increasingly becoming an imperative. As opportunities for creative innovation at work are limited by economic constraints, and worker mobility is reduced by mortgage interest rates and transportation costs, recreation will become one of the few remaining realms of life where one can make personal choices. As recreation is recognized as the last chance to exert personal freedom, leisure will increasingly be valued as a civil right. And as work options are limited, people will begin to define personal success in terms of their leisure accomplishments almost as commonly as we now do our career achievements. When that happens outdoor recreation will become a far more important political issue than ever before. With the possible exception of Robert Moses in New York, few political leaders have used public recreation as an effective political weapon. That may well be changing.

Economic Restraints

This change in the political stature of outdoor recreation could be further accentuated by current economic trends. As Proposition 13 thinking moves from the state house to Capitol Hill, we can clearly anticipate reductions in federal and state spending on outdoor recreation. And this could become a long-term trend as defense and energy mobilization programs command major new budget commitments for years to come. At the very time when rising consumer spending on recreation is expected, this proportional reduction in public spending will intensify user conflicts over facilities. As special interests compete for scarce public dollars and overused recreation sites, political tensions will escalate. For the outdoor recreation industry, however, this may be the golden opportunity for investment in heretofore publicly-supported facilities, with little fear of competition from free government areas.

Converging Trends?

These, then, are some of the broad social trends which will influence the future of outdoor recreation. But what do they add up to, in terms of specific recreation issues that those of us here must grapple with in the future? The answer to that question will, hopefully, emerge in part

during this symposium. And rather than a single set of answers, I expect we will find that there are several possible scenarios, depending on the kind of future we want and seek as a society.

Let me suggest but one such scenario, in an attempt to address the specific topic assigned to me in the title of this address -- "converging social trends." If the trends I've touched upon in terms of energy, life style changes, and revised work ethics do converge, what is the probable outcome in human and social terms?

The country I envision will be one characterized by individualism, by special-interest group power, and by political and social regionalism. In sum, a nation considerably more decentralized than we have known for decades. Let me take these three characteristics one at a time.

First, we can expect people to place great importance on individualism; on unrestrained freedom of personal thought and action. This idea has been developed in some depth by Alvin Toffler in his new book The Third Wave. He foresees a new "de-massified society" where the computer will smash the mass culture of today; where the mass media will lose control as individuals at video terminals will select information and computerized, one-at-a-time custom manufacturing will make it possible to tailor-make almost anything.

While I am uncomfortable with Toffler's high-technology scenario, I am persuaded that the kind of individualism he suggests is on the rise. As the civil rights movements of the past few decades reshape our cultural attitudes, the acceptance of personal diversity will pervade society. People everywhere are rapidly becoming more accepting of others' values and life styles and they are seeking their own distinctive identities through clothing, home furnishings, career changes, alternative family styles, and, increasingly, through their recreation pursuits. Not only are they seeking unique and diverse forms of recreation in order to escape the anonymity of mass culture, but they are aspiring to new levels of achievement previously reserved for amateur fanatics and professional athletes.

What this means for the recreation industry is not completely clear. Perhaps it will mean less faddishness, with fewer major shifts in national recreation interests. Perhaps it will mean public support for a much wider range of recreation activities and deeper commitments to excellence, with growing demands for better quality facilities and equipment than in the past. But whatever these trends mean for the recreation industry, or in terms of consumer behavior, I am convinced that they will have important political implications.

The Second aspect of the decentralized society will be a strengthening of special interest group power. In a way this seems to be a contradiction of the growing acceptance of personal individualism I've just described. But rather than reflecting personal prejudice and interpersonal conflict, however, the rapid growth of special interest groups reflects a reaction to centralized authority; to the power of big government and big business. The result may well be a struggle between interest groups as they compete for public monies, facilities, or land use control, but the real impacts will be felt in Washington, not among the minorities who lose a particular battle.

In the long run, the impact of this special interest infighting will be that timely and critical political decisions will be increasingly difficult to make at the national level. Coupled with the steady weakening of broad-based political parties, special interest power will make it impossible to build majority constituencies for enlightened national policies. We already see the Congress unable to develop comprehensive policies for energy, for the reorganization of natural resource agencies, or for a systematic classification of remaining roadless areas on public lands. And as Congress and the executive branch are further paralyzed by conflicting special interest group pressures, we can expect the already enormous backlog of litigation clogging the courts to increase. A recent example is the district court decision in California throwing out the Forest Service's environmental impact statement for RARE II, a ruling that could effectively nullify the entire RARE II program and send the problem of wilderness classification back to the Congress. If that happens, we will see the biggest special interest alley fight over natural resources in history.

The list of potential user conflicts is almost endless. Wherever a strong special interest group seeks special consideration, and resources are limited, conflict will be inevitable. Win-lose fights in the courts and legislatures will be common. Whether wilderness advocates against snowmobilers, the contests will be heated. Urban based conflicts will be even more common as limited open space and parklands are sought by team and court sport groups for expanded facilities. Wetlands will be another arena for conflict as preservationists battle recreation groups for limited shore and water resources, especially for previously polluted waters now clean enough for recreation development or wild area reservation.

These conflicts will further fragment the already shaky coalition of conservation and environmental interests in the Nation, weakening the ability of national organizations to mediate conflict and guide compromise bills through

Congress. The trend toward decentralization will be inexorable once it gets moving.

On the positive side, however, the growing power of special interest groups can be viewed as the product of people's willingness to become involved; a reflection of their willingness to make a commitment to a cause with a group of likeminded enthusiasts. And, while the early impacts of this new era of special interest power may seem destructive of traditional American regionalism with its corresponding high level of local political involvement.

A New Regionalism

I'm obviously getting on thin ice to suggest that all the fact and fancy I've employed so far leads to such a single-minded convergence of forces, but the logic of such a scenario is compelling. Energy costs will certainly be a powerful force in reducing interregional transfers of resources, people, and commodities. Life styles appropriate to the southwestern United States, for example, will no longer be transferable to New England simply by an advertising blitz or corporate franchising. Nor will it be possible for the federal government to ignore regional energy limitations. New policies will have to be built on a sound understanding of unique regional needs, and designed to strengthen state and local institutions essential for policy implementation. Special interest groups will block federal initiatives unresponsive to their local constituents, making recognition of regional distinctives a national imperative.

I am convinced, therefore, that the future of natural resource management -- and the management of outdoor recreation resources -- will be decided at local, state, and regional levels. It has to be. That is where ecosystems, land use patterns, and cultural values come into focus in sufficient detail to make meaningful decisions possible. That is the level where special interest groups might be able to find common ground in terms of people's values and the economic realities of day-to-day living.

I personally find such a trend toward regionalism exciting. We might, as a people, be forced again to discover that special "sense of place" which defines our relationship to one another and the land where we live. This rediscovery of our "sense of place" -- this new regionalism -- need not be a return to local isolationism or parochialism. For, as Rene Dubos has suggested, we must "think globally and act locally." We must be fully aware of the national and global context in which we live. We must take full advantage of modern communications and electronic information processing to understand the limits and opportunities of our special place. But, when it comes to making decisions about how to respond to outside forces and local capabilities, we will take action on a regional basis and ultimately at a very local level. It's a sort of "small is beautiful" philosophy tempered by a realistic awareness of global forces. It's a practical expression of our "sense of place" in action terms.

Lest you think I am painting a picture of a new Brigadoon, regionalism will have its own set of special problems and issues of significance for outdoor recreation. Struggles over basic questions of property rights will intensify as user groups contend for access to water and land resources. As new owners of increasingly smaller parcels of land in many regions post their lands against public use we will see new initiatives to limit property rights, especially as land values soar and public acquisition budgets are reduced. Contests between various user groups with specialized facilities needs will likewise intensify as federal revenue sharing programs are eliminated and local governments withdraw from recreation program management.

But because of decentralized modes of personal and political decision making, patterns of outdoor recreation will vary across the Nation. Distinctive regional identities will re-emerge with their own unique playtime and sport preferences. In addition, energy limitations and other emerging regional cultural values will influence outdoor recreation interests, merging into identifiable styles of living that will exert a powerful influence on where people seek to live and work.

The head of Vermont's Agency of Environmental Conservation, Brendan Whittaker, once speculated about such trends something like this: Places like Vermont, where energy limitations will be severe and where environmental awareness is high, will attract a certain kind of person. Other areas, where energy is relatively cheap and people value old-fashioned consumer patterns, will attract different types of people. Thus, he speculated, Vermont may be relatively poor in growth-economics terms, colder, cleaner, and populated by rugged individualists who value their environmental amenities and are willing to cut firewood. Other areas, perhaps in the southwest, will be warmer, richer, and dirtier, populated by people who prefer large cars, air conditioning, and electric heat, and who are too busy "to smell the roses."

In either place, those of us concerned about outdoor recreation will have our jobs cut out for us. We will have to be prepared to respond to local and regional differences; to adapt national policies and programs to regional patterns; and to reinterpret the meaning of past trends from yesterday's mass society. It will be hard, but fun. Our clients will be less fickle and unpredictable. They will be seeking higher quality experiences and more durable,

well-designed facilities and equipment. They will be well informed about their sport or activity, and prepared to support agencies or companies with whom they agree through effective special interest political organizations.

Whether or not you agree with this brief scenario for tomorrow; whether you like it or not, I hope I have provoked you to think about some better alternatives. If this symposium is to be more than a recitation of data about trends, and more than an exercise in projecting the past on a straight line into the future, you will have to employ your creative abilities to the limit. The future is not waiting out there to be discovered. It doesn't yet exist. It will be no better than we can imagine; no better than we are determined to make it. Trends may enlighten our understanding of the alternatives, but they will be destiny only if we insist.

TRENDS IN OUTDOOR RECREATION LEGISLATION[1]

George H. Siehl[2]

The two decades which have passed since the era of the Outdoor Recreation Resources Review Commission (ORRRC) have been active and fruitful in terms of Federal recreation legislation. The Commission and its final report "Outdoor Recreation for America" strongly influenced the burst of recreation legislation in the 1960's. Even today, the studies prepared under the guidance of the Commission continue to provide useful baseline data. This paper addresses three areas of trends in outdoor recreation legislation--trends in context, content, and consequences.

TRENDS IN CONTEXT

This is the simplest of the trend areas. It is based upon the realization that recreation is not one of those fields--such as national defense or education--that is considered as an entity by the Congress. Rather it is treated as one member of a family of issues. In the case of recreation, it entered the decade of the 60's as part of the bundle of issues called conservation, a context which consisted in large part of a philosophy toward the uses of natural resources. That philosophy embraced the concept of "balance" between consumption and protection of resources.

For a time after the completion of the ORRRC, the level of legislative activity was high enough to make it seem as if recreation might be important enough to stand alone.

During the mid to late 60's, however, the idea of conservation was being transformed into the broader concept of environmentalism. One catalyst to this transformation, I believe, was the "natural beauty" campaign of Mrs. Lyndon B. Johnson. Her efforts (and the support of President Johnson didn't hurt) brought a wide degree of public awareness that amenities such as parks and recreation areas are important components in determining the quality of life. Further, the public came to recognize the interrelatedness of various activities and the tradeoffs which take place among economics, environment and, a little later, energy.

Thus, through the late 60's and midway into the 70's, recreation considerations were tied to the concept of the environment. Environmentalism differs from conservation rather significantly, however. The environmental movement in seeking to check pollution and other types of degradation has adopted a highly protective stance. For recreation matters, this frequently results in support of preservation efforts and seldom in support of more intensive or development-oriented forms of recreation.

The preservation movement has secured legislation protecting areas which future generations may enjoy. A high price may be paid for these successes, if, as seems to be likely, the broader recreation community has been divided into new preservation and old conservation camps, each of which goes its own way or enters into new contextual relationships.

Where could the user recreationists--as opposed to the preserver recreationists--find their new context? The answer seems to be the economy. The formation of a 243 member Recreation and Tourism Caucus in the House of Representatives; the concerted action of the Congress to prevent weekend gas station closings as part of the President's proposed standby energy conservation program; and the strong reaction to the Energy Department's proposed regulation which could prohibit weekend operation of powerboats in times of energy shortage seems to indicate that Congressional support is there for use-oriented recreationists. The reason is that recreation and tourism are of widespread, major economic importance. As the state of the economy worsens, Congress will possibly become even more protective of viable recreation enterprises.

At the same time, preservation efforts may not be as successful as in recent years, particularly when the choice is to create a new

---

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2]Analyst in Environmental Policy, Library of Congress, Washington, D.C. 20540.

Wilderness area or allow the recovery of an energy resource or a strategic mineral resource. The context for preservation decisions could shift from environmental protection to the completely different arena of national security. Perhaps with the MX missle siting proposal and the controversy over the cobalt deposits in the proposed West Panther Creek wilderness area, the shift is already underway.

TRENDS IN CONTENT

In the past 20 years there have been hundreds of recreation laws passed, thousands of bills introduced, and billions of dollars authorized and appropriated. What were the details of all that legislation?

Instead of reviewing all that's happened, let's look at the trends in five content categories--although that does not exhaust all the possibilities. The five are:

1. Authorization of Federal park and recreation areas;
2. Authorization, planning and management of Federal resource agencies;
3. Assistance to non-Federal agencies;
4. Financing Federal recreation areas; and
5. Related environmental legislation.

In the first category--authorization of Federal park and recreation areas--there are several noticeable trends. Foremost is the trend which saw the number of units increase sharply. The National Park Service, for instance, numbered 209 units in 1960, 281 in 1970, and today 320; including the Executive withdrawals in Alaska. Acreage figures have increased correspondingly. A second, closely-related trend is that toward the acquisition of private lands for addition to the public recreation estate. The authorization of Cape Cod National Seashore in 1961 marked the first time that Congress went to the Federal Treasury to buy all the lands for a Federal recreation unit. Earlier Eastern additions to the Park System, such as Shenandoah National Park, Virginia, and Acadia National Park, Maine, were acquired through private, state, and local funding efforts, then donated to the Federal government. Buying land for parks was much more expensive than setting the acreage aside from other Federal holdings; hence a third trend in recreation legislation, acceptance of increased costs.

A fourth trend in the authorizations of new Federal recreation areas has been the creation of specialized areas as wilderness, wild and scenic rivers, and national trails. The establishment of national seashores and national lakeshores is further indication of the trend toward recognizing the attractiveness of certain natural features to outdoor recreationists. The creation of designated National Recreation Areas to be managed for intensive recreational use shows Congress has been aware of a broad public demand for recreation opportunities.

The second trend category, dealing with the structure and administration of those Federal agencies with recreational responsibilities, would include as its highlight the 1963 Congressional authorization which led to the establishment of the Bureau of Outdoor Recreation (BOR) in the Department of the Interior. Other pertinent legislation includes the 1960 Multiple-Use Sustained Yield Act, the Resources Planning Act of 1974, and its 1976 amendment, these relating to forested lands and especially the Forest Service, and the more recent organic act for the Bureau of Land Management, the Federal Land Policy and Management Act of 1976. These enactments were not principally directed toward recreation, but they do help to ensure that recreation is one of the purposes for which Federal lands will be managed.

Assistance to non-Federal recreation agencies, the third trend category, is headed by enactment of the Land and Water Conservation Fund. This mechanism has provided over 2.5 billion dollars to the States since 1965 to assist in the planning, acquisition and development of outdoor recreation facilities. Federal recreation legislation has also provided for the donation of surplus Federal real property to other units of government for recreational use. Further, Federal agencies may give technical assistance in recreational matters to non-Federal resource agencies. This was one of the provisions of the 1963 Act which led to creation of the BOR. The level of funding support to the States has increased over the years since 1965, clear evidence the Congress has seen the need for a partnership approach to meeting outdoor recreation needs. Although there have been occasional disruptions in this support program (the most serious of which is now threatened in the President's revised budget request), the trendline has been clearly upward.

Much of what was said about the assistance provided to State and local government applies to the fourth trend category--financing Federal recreation areas and activities. The Land and Water Conservation Fund has been helpful in securing the passage of authorizing legislation for new recreation areas because Members did not have to vote at the same time to appropriate more money. The funding for the unit would come from the LWCF. The need to vote to put more money into the fund was largely done away with by tapping the mineral leasing revenues from the Outer Continental Shelf in the 1968 amendments to the LWCF Act. It was through this mechanism that the Fund grew from $120 million in 1966 to its current authorized

level of $1 billion.

The authorized funding level provides slight solace to recreationists at this time. President Carter requested less than full funding ($580 million) in his first budget request for FY 81. The Congress reduced that figure in Committee action to $290 million. Then the revised Carter budget lowered the request to $233 million. Some are reminded of the pre-LWCF days when some Members would vote for establishment of a park unit and later vote against the appropriation of funds for acquisition.

To summarize the trend in financing, one might say that it is up, but not certain.

The final category of legislative trend is that of environmental laws which provide direct or indirect support to outdoor recreation. Clean water bills have resulted in thousand of miles of cleaner streams and rivers and thus restored an important recreation resource. Thus, water bodies once again may support recreation fishing and boating and water contact sports. Further progress in this regard is to be expected. The 1977 amendments to the Clean Air Act stipulate that certain park and wilderness areas are to be protected from significant deterioration of their air quality.

TRENDS IN CONSEQUENCES

Passing a law is something like passing a message because after transmission, the outcome sometimes varies from the intent. These inadvertencies of legislative action may produce trends with broad, but delayed consequences.

One such trend is bringing the Park Service back to town. During the decade of the 1970's Congress enacted legislation to establish sizeable units of the National Park Service in New York (Gateway National Recreation Area), San Francisco (Golden Gate National Recreation Area), Cleveland-Akron (Cuyohoga Valley National Recreation Area), Atlanta (Chattahoochee River National Recreation Area), Lowell (Lowell National Historical Park), and Los Angeles (Santa Monica Mountains National Recreation Area). Many applaud this movement of parks to the people. However, these urban areas tend to be expensive to acquire and to operate because they are rather manpower intensive.

In an era of unlimited Federal resources a program of helping to meet urban recreation and open space needs when local government cannot do so may help to achieve a balance in recreational opportunities. When the Federal resources become limited, as now, what will be the consequences? If the available financial and manpower resources are concentrated on the expensive urban areas, what happens to the traditional Park System units? We may be about to find out.

Another trend in consequences, which was touched upon in the discussion of trends in context, is that in legislation for recreation preservation the opportunities for recreation provision are being reduced. This is perhaps best exemplified at the largest scale by noting that the creation of new wilderness areas has eliminated some possibilities for developing new alpine skiing areas. A mechanism which emphasizes one recreational use without providing for similar consideration of others inadvertently reduces the likelihood of examining alternative uses. Enactment of something like a Developed Recreational Facilities Siting Act might balance the effectiveness of the Wilderness Act and so provide even greater recreational opportunities.

UNTOUCHED TRENDS IN RECREATION LEGISLATION

The coverage of this paper has omitted more legislation than it has included. It has, however, identified some of the more important trends which might be discovered in a lengthier review. There are other trends which might be examined in some future forum. Two which come immediately to mind are the changes which have taken place in the Congress and in the outdoor recreation constituencies.

In the first instance, we should note that the guard has changed, and that many of the prime shapers of Federal recreation legislation and systems are gone from the Washington scene. Their experience and influence cannot be quickly replaced, although some newer Members are supportive of recreational matters.

In the second instance, the number of groups which have made the case for recreation legislation before the Congress has increased. Some of these new groups, such as Friends of the Earth, have represented a strong protectionist philosophy. Now, however, additional organizations, such as the American Ski Federation, representing a different economic and development attitude toward recreation matters are coming onto the Washington scene.

The resulting interplay between the changing Congress and the changing voices for outdoor recreation interests should provide for interesting new trends in the near future.

LAND MANAGEMENT POLICY AND PROGRAM TRENDS[1]

Darrell E. Lewis[2]

There has been a shift in federal land management agencies toward less facility-oriented recreational activities. This shift is described by executive messages and legislation. Other indicators of the shift are President Carter's environmental message of 1979, establishment of additional National Recreation Trails, and a combined report to the President by the Secretaries of Agriculture and Interior which describes coordinated objectives and action plans developed by the Bureau of Land Management and the Forest Service.

In spite of the fact that land management policies and programs have recently focused on such topics as oil and gas, coal, timber, and range, there have been several key indicators of outdoor recreation trends.

President Carter's Environmental Message of August 2, 1979, contained specific directions regarding Wild and Scenic Rivers, Trails, and increased coordination between the two largest federal land managers, the Bureau of Land Management and the Forest Service. The Urban Recreation Study conducted by the Heritage Conservation and Recreation Service signals another change in emphasis. The popularity of the term "dispersed recreation" in several land management agencies signals a shift toward less facility-oriented recreational activities. Yet another indicator is the adoption of the Recreation Opportunity Spectrum by the Bureau of Land Management and Forest Service as a means of dealing with recreation within the multiple-use management perspective. In this paper, some of these key signals are identified and briefly described.

PRESIDENTIAL ENVIRONMENTAL MESSAGE OF 1979

Wild and Scenic Rivers

"Development along the banks of our rivers continues to outpace our ability to protect those rivers that might qualify for designation. This problem is particularly acute near urban areas, where there are greater demands for recreational opportunities which can partly be met by river protection.

We need to speed up the process for studying Wild and Scenic Rivers for designation and to consider the protection of rivers or parts of rivers which can protect important natural ecosystems. Moreover, the federal government should set an example of sound management for state, local, and private landowners by taking an aggressive role in protecting possible Wild and Scenic Rivers which flow through our public lands. Accordingly, I am directing the following actions be taken:

- federal land management agencies shall assess whether rivers located on their lands and identified in the National Inventory prepared by Heritage Conservation Service are suitable for inclusion in the Wild and Scenic Rivers System; if so, these agencies shall take prompt action to protect the rivers--either by preparing recommendations for their designation or by taking immediate action to protect them;

- all federal agencies shall avoid or mitigate adverse effects on rivers identified in the National Inventory; and

- the Secretary of Agriculture and the Secretary of the Interior shall jointly revise their Guidelines for evaluating wild, scenic, and recreational rivers to ensure consideration of river ecosystems and to shorten the time currently used to study rivers for designation."

These measures are currently underway and represent a considerably stronger protective stance on the treatment of possible Wild and Scenic Rivers which flow through federally administered lands.

---

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2]Chief, Division of Recreation and Cultural Resources, Bureau of Land Management, USDI, Washington, D.C. 20240.

National Trails

"Under my direction, the U.S. Forest Service will establish 145 additional National Recreation Trails by January 1980, achieving a goal of two National Recreation Trails in each National Forest System unit. I am directing each federal land management agency to follow the example set by the Forest Service and by January 1980 announce a goal for the number of National Recreation Trails each agency will establish during 1980 on the public lands administered by the agency. I am also directing that, by the end of 1980, a minimum of 75 new National Recreation Trails shall be designated on public land other than National Forests by the federal land management agencies.

I am directing the Secretary of the Interior, through the Interagency Trails Council, to assist other federal agencies in surveying existing trails on federal lands to determine which of those can be made part of our National Trails System and to initiate a grass-roots effort in every region of the Country to assess our nationwide trails needs. In addition, I am directing the Secretary of Agriculture, the Secretary of Defense and the Chairman of the Tennessee Valley Authority to encourage states, localities, Indian tribes, and private landholders to designate trails on their lands."

This effort has refocused land manager's attention to hiking trails across the Nation.

Coordination between the Bureau of Land Management and the Forest Service

"I am directing the Secretary of the Interior and the Secretary of Agriculture to work together to coordinate their Departments' natural resource policies and programs, particularly those of the Bureau of Land Management and the Forest Service. I am requesting the two Secretaries to develop within six months a detailed statement of coordination objectives and a process and timetable for achieving them."

This assignment resulted in the submission of a report to the President by the Secretaries of Agriculture and Interior on February 6, 1980.

The report describes coordination objectives and action plans developed by the Bureau of Land Management and the Forest Service. The report addresses the following areas:

1. Program Cycles
2. Program Development
3. Jurisdictional Transfers and Boundary Adjustments
4. Energy and Minerals
5. Common Procedures in Grazing Management
6. Sharing Facilities/Personnel/Training
7. Research
8. Public Involvement
9. Other

Of particular interest to this group is the fact that outdoor recreation policies and procedures have been identified for the formation of a topical subgroup to develop action programs.

Recreation Opportunity Spectrum

This will prove to be quite timely as the Bureau of Land Management and the Forest Service have already begun to come closer together philosophically on the basics of outdoor recreation. Thanks to the research efforts of the Forest Service, the concept of an outdoor recreation spectrum has been endorsed by both agencies and is presently being incorporated into inventory, planning, and management policies and procedures for both agencies.

Recreation Land Acquisition

Another recent indicator of outdoor recreation policy has been the administration's proposal to reduce the federal portion of the Land and Water Conservation Fund from $357 million available in FY 1980 to $256 million to reduce federal spending. An additional cut from $252 million to $75 million is being proposed by the President for FY 1981.

THE U.S. ARMY CORPS OF ENGINEERS RECREATION RESOURCE MANAGEMENT CHALLENGES[1]

Gerald T. Purvis[2]

This paper provides a brief legislative history of Corps responsibilities for public recreation, outlines its relationships with non-federal agencies and organizations and describes a number of environmental concerns it sees in its new outlook for management of recreation resources. A Recreation-Resource Management System is also described that contains data on the management of natural and developed resources, personnel and other relevant subjects at more than 400 Corps projects.

The purpose of this paper is to give a general overview of the Corps of Engineers and the Recreation-Resource Management Program at water resource development projects. A few selected current problems are outlined and presented in brief discussion.

The U.S. Army Corps of Engineers was the first federal agency to protect public park lands when they were called on to protect the resources of Yellowstone National Park in 1886. This lasted for nearly 30 years until Congress created the National Park Service. However, it wasn't until enactment of the Flood Control Act of 1944 that the Corps actually became a major land management agency with all of the inherent visitor assistance responsibilities.

It is the policy of the Corps to provide safe and healthful recreation opportunities while protecting and enhancing the project resources. In the original acquisition of land at civil works installations, the Corps of Engineers obtains proprietary interests only. Individual states and their political subdivisions retain the statutory authority and inherent responsibility to enforce state and local laws. Park managers and rangers do not have the legal authority to enforce state and local laws. Our authority is limited to issuance of citations for violation of Title 36, Code of Federal Regulations. Park managers and rangers do not have the legal authority to arrest, carry weapons, or other items such as mace, nightsticks, or other similar equipment normally associated with law enforcement. Park managers and rangers cannot search or seize under this authority. Personnel may stop, but not physically detain the public while implementing these regulations. The citation authority used to implement Title 36 was enacted by Congress in 1970.

In 1976, Congress, recognizing the limited authority of the Corps in law enforcement and also the burden that these projects had placed on local authorities, enacted Section 120 of the Water Resource Development Act of 1976. This authority provided that the Corps could enter into contracts with states or their political subdivisions to obtain increased law enforcement at Civil Works water resource development projects. It is not intended that this authority diminish or otherwise limit the existing law enforcement responsibilities of the state or local law enforcement agencies. Unfortunately, the Congressional authority was limited to fiscal years 1978 and 1979 on a trial basis. Although the Corps and local authorities have praised the program as being successful, Congress has not extended that authority. We hope they will do so very shortly. We have found that this program has created better cooperation and rapport between local law enforcement officers and Corps project personnel, reduced incidents of vandalism and other disturbances, increased public's sense of security and reduced the Corps personnel's exposure to high risk situations affecting their safety and that of the public. Currently, the Senate has proposed a bill which would extend this authority.

---

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2]Chief, Recreation-Resource Management Branch, U.S. Army Corps of Engineers, Washington, D.C. 20314.

While the Corps does not take its visitor assistance responsibility lightly, we hire our personnel for a professional job of managing project resources, not to perform law enforcement duties. We will continue to train our personnel to assist the visitor in every way possible, but maintaining a low key law enforcement image.

In 1965, the Federal Water Project Recreation Act (P.L. 89-72) was enacted requiring that full consideration be given to the opportunities, if any, that water resource projects afford outdoor recreation and fish and wildlife enhancement. This legislation also requires that, on projects authorized after 9 July 1965, 50 percent of the separable costs for development of recreation facilities be borne by a non-federal public agency and that the non-federal public agency bear the cost of operation and maintenance of the recreation.

Only two major land management agencies of the federal government are affected by P.L. 89-72; the Corps of Engineers and the Water and Power Resources Service. Other federal land management agencies continue to develop recreation facilities at 100 percent federal cost. Studies have shown that the major impact of the provisions of P.L. 89-72 is on the Corps projects. This is partly a result of the ability of the Water and Power Resources Service to transfer operation and maintenance responsibilities at their projects to the National Park Service and other Bureaus of the Department of the Interior.

Once a transfer has been made to another federal agency, the provisions of P.L. 89-72 are not applicable to that agency. A Corps project constructed outside the boundaries of a national forest, for example, is subject to the cost sharing provisions of P.L. 89-72. However, when a Corps project is constructed partially or wholly within the boundaries of a national forest, responsibilities for planning, development and management may be transferred to the U.S. Forest Service under the terms of the 1965 Memorandum of Agreement between the Secretaries of the Army and Agriculture. Those lands which are transferred to the Forest Service under such an agreement may be developed by the Forest Service without a cost sharing agreement with a non-federal agency. Those lands retained by the Corps require a cost sharing contract with a non-federal public agency prior to development of recreation facilities.

Adequate time has passed for the basic assumption of P.L. 89-72 to be tested. Although countless contacts have been made with non-federal agencies in attempts to solicit non-federal sponsorship of recreation developments at Corps projects, progress has been very limited. Since the passage of the Act, 14 years ago, only 21 contracts have been consummated on 20 Corps projects.

The National Society for Park Resources, formerly the National Conference on State Parks, and a branch of NRPA, has passed resolutions opposing P.L. 89-72 as now written. NSPR spoke for all the Directors of State Park Agencies in passing these resolutions. The main objections to the act are (1) the imposition of financial hardships on state and local agencies, and (2) the program does not function in concert with state and local objectives and priorities.

It is difficult for states to commit their legislatures to a contract which requires 50 percent of the development cost for recreation in addition to the assumption of operation and maintenance and replacement responsibilities for a 50-year period on land to which the state holds no title. Considerable objections from state and local agencies in this regard have been encountered throughout the process of trying to obtain contracts at Corps of Engineers projects. Many states have constitutional or statutory prohibitions which preclude them from entering into long-term contracts as required by Section 221 of the Flood Control Act of 1970.

Over the years the Corps of Engineers has always been successful in receiving non-federal cooperation in development and management of recreation areas when the proposal is compatible with the overall plans and objectives of the non-federal agency and within the budgetary limitations of that agency.

Since the beginning of Fiscal Year 1974 when the cost sharing principles of P.L. 89-72 were applied to further recreation development at completed water resource projects, the Corps of Engineers has entered into 113 contracts and supplemental agreements with non-federal entities.

From time to time, Congressional attention has been devoted to the provisions of P.L. 89-72 and attempts have been made to define workable amendments to the legislation. The most recent such amendment is contained in Senate Bill, S-2054. Among other things, this amendment would provide for an expansion of the minimum basic recreation and fish and wildlife areas and facilities to be provided at full federal funding. It also provides for retention of lands acquired for recreation and fish and wildlife purposes for which they were acquired as long as the lands are capable of serving the purpose for which they were acquired. The bill would also provide that when an agreement cannot be executed with a non-federal public body, the agency could develop and manage the area subject to an approved master plan to meet recreation needs. The amendment further provides for the encouragement of the development of tourist facilities by the private sector.

While no 89-72 contracts have been cancelled, approximately 70 recreation areas have been returned to the Corps for operation and maintenance. In these cases the facilities were built at 100 percent federal cost and leased to the locals for operation and maintenance purposes. The state of Pennsylvania is currently considering turning six projects, now under lease, back to the Corps for O&M. Considering the limited resources available, it may become necessary to close these areas to public use until the local sponsors can meet the O&M responsibilities.

The Corps of Engineers has been committed for several years to contracting with the private sector for a great deal of its goods and services. We have been relying on private contractors to perform many routine services, i.e., daily park maintenance, scheduled grounds and facility maintenance, one-time maintenance jobs, park gate attendances, use fee collectors, and major repairs, etc.

In March, 1979, OMB issued a revised OMB Circular A-76 which (1) reaffirms the Government's general policy of reliance on the private sector for goods and services, while recognizing (2) that certain functions are inherently governmental in nature and must be performed by government personnel, and (3) relative cost must be given appropriate consideration in decisions between in-house performance and reliance on private commercial sources.

The guidelines included in A-76 will require the Corps to review its total program of activities and determination will have to be made on how those activities will be achieved, in-house or by contracting out. Frankly, the guidelines are geared to contracting out. However, there are circumstances which indicate performance by in-house capability. In the area of recreation resource management, we feel that we can continue to demonstrate that some of our tasks can be accomplished in-house at a cost that is less than contract performance. In other words, we will contract out if it is cost efficient. This does not mean that we will get any new personnel spaces if the activity based on A-76 guidelines can best be performed in-house. Additional personnel spaces may be requested from OMB if this is the case.

The A-76 guidelines will have no cause or effect on the Set-Aside Programs such as 8-a or minority contracts. It is the general policy of the Corps to ensure that small businesses, including those owned and managed by disadvantaged persons, receive a fair share of government contract awards.

A number of environmental concerns are a part of the new outlook for recreation resources management in the Corps.

1. The Aquatic Plant Control Program has expanded to meet problems which have become recognized throughout the Country. Research, planning, and control/operations have been increased to address biological, chemical, mechanical and integrated control techniques to major populations of obnoxious aquatic plants. Legislation has been introduced to increase the annual budgetary ceiling from $5 million to $15 million.

2. Wildlife management and enhancement of Corps projects have received considerable attention recently. Efforts are underway to assure that uniformly high quality wildlife management programs are applied consistently at Corps projects. Further efforts are underway to determine better techniques for satisfying our needs and responsibilities for mitigation of the loss of wildlife habitat and enhancement of habitat at existing projects. Many factors are, of course, involved in our reemphasis of wildlife management at our projects. The first is the character of wildlife resources of a plant community, as determined by the structural characteristics of those communities, and secondly, the characteristics of the wildlife fauna, as determined by the distribution and diversity of the various plant communities. These same characteristics, of course, also contribute to the value that an area has a recreation site. Vegetation characteristics include type, shape, height, and mix of different species. These are used to determine the effects relationship between the proposed use and wildlife of the same area.

The species in each of these communities react differently to permanent recreation development. Some species benefit, while others would suffer. From this analysis, it may be determined that two mammals and three different bird species would be impacted by recreation development. For example, these may include deer and elk, and osprey, fan-tailed pigeon, and great blue heron.

In developing a process for other Resource Use Objectives programs for wildlife analysis, a series of basic steps should be considered: (1) obtain aerial photographs of project and the immediate area, (2) use the photo interpretation to map the vegetation zones, (3) select a stratified sample of each type of vegetation zone by conducting a ground survey to include the structure and composition of the vegetation and establish wildlife in vegetation zones, (4) coordinate with state and federal resource agencies to develop the species of specific concern, determine the problems associated with those species, and to determine areas of specific use for those species, and (5) formulate an effective relationship between vegetation and wildlife to develop a plan to optimize wildlife and recreation use. From this basic analysis, we

will come to a more realistic concern for the impacts of recreation on the environment.

3. Pollution abatement efforts at Corps projects continue. New facilities and rehabilitation of existing facilities to meet legislative requirements in recreation areas and at operational areas of Corps projects receive a relatively high priority within the overall mission of the Corps.

4. Lakeshore management efforts at existing projects have generally been successful in maintaining natural ecological values and providing for equitable public use at the 48,000 miles of shoreline located on Corps lakes.

5. For the past two years the Corps has participated with the National Wildlife Federation and others in the annual mid-winter Bald Eagle survey. We have found that the winter range for the Southern Bald Eagle has been enhanced by the creation of major dams on the waterways in the major flyways. These dams, in most cases, provide the only open water available in the area. Further, hydro-power projects provide food, in the form of chopped-up fish, during periods of generation.

6. The Recreation Research Program (RRP) is an on-going research and development program managed by the Waterways Experiment Station in Vicksburg, Mississippi. Each year problem statements are evaluated and prioritized; those receiving the highest priority ratings are generally funded first. On-going research projects include the development and management of a Recreation Research and Demonstration System and guidelines for the establishment of carrying capacities. Other research topics include visitor safety, operations and maintenance contracting, concessionaire opportunities, and criteria for the development of roads and sanitary facilities.

A final on-going research program being managed by the RRP involves determining what impacts the energy situation is having on visitation patterns at Corps recreation areas. A final report is now being prepared and should be available by the end of this summer. There were some declines in visitation during 1979 on some Corps projects. Overall, however, demands for Corps resources are steadily increasing. Visitation to Corps recreation areas rose by 3 percent between 1978 and 1979 despite record high gasoline prices and shortages in many areas. One obvious reason for this increase is that 80 percent of all Corps projects are located within 50 miles of a Standard Metropolitan Statistical Area (SMSA). Of these, 71 percent have metropolitan populations of 100,000 or more. Around 25 percent are either partially or wholly contained within an SMSA. Even though current data await further analysis, it looks as though the gasoline situation, by forcing people not to travel as far but stay longer, will place even greater demands on Corps recreation facilities than ever before.

The Recreation-Resource Management System (RRMS) is an automated data base which has been maintained by the Recreation-Resource Management Branch since 1972. The RRMS contains data on more than 400 Corps of Engineers projects with an annual visitation of more than 5,000 people. Each project in the RRMS has data on the management of natural and developed resources, personnel, and other relevant project data.

Because the RRMS was designed to be a management information system, it was substantially modified in FY 1979 to provide comparative analysis of year-to-year data since CY 1978. In addition, all Corps districts and divisions were provided with immediate access to the data base through the use of remote terminals and a user oriented programming language. The enhancements of the RRMS allowed district and division personnel to prepare unique, ad hoc reports to assist in making day-to-day management decisions.

The Office of the Chief of Engineers uses the RRMS as a management tool and has the responsibility to provide several federal agencies with annual reports specifically tailored for their management needs. The RRMS is also used to respond to inquiries from Congress; other federal, state, and local agencies; universities; and interested parties concerned with recreational aspects of Corps projects.

Additional information on the RRMS is available from the annual publication "Recreation Statistics" published by the Corps of Engineers.

In general, these are some of the major challenges facing the Corps in the 80's. We must find more efficient ways to manage our resources. We must not only provide for recreation opportunities, we must protect and enhance the project resources. With increasing legislative requirements we must also reemphasize our environmental and fish and wildlife responsibilities.

A METHODOLOGY FOR THE SYSTEMATIC COLLECTION, STORAGE, AND RETRIEVAL OF TREND DATA FOR THE U.S. ARMY ENGINEERS RECREATION PROGRAM[1]

Dennis B. Propst, Outdoor Recreation Planner[2]
U.S. Army Engineers
Waterways Experiment Station
P. O. Box 631
Vicksburg, MS

Robert V. Abbey, Outdoor Recreation Planner
U.S. Army Engineers
Waterways Experiment Station
P. O. Box 631
Vicksburg, MS

INTRODUCTION

In 1979, over 450 million recreation days[3] of use were reported at 419 Corps of Engineers lakes and other project areas. This figure represents a 2.7 percent increase in use over 1977 (424 million recreation days). The Corps and other agencies (quasi-public, state, local and other federal agencies) manage 3,175 recreation areas on a total of 11.2 million acres of land and water. The Corps manages 2,229 (70 percent) of the recreation areas and has the responsibility for managing more than 44,000 developed campsites. Other agencies, excluding concessionaires, manage 946 recreation areas with 28,000 developed campsites.

The tremendous use of such a large and diverse recreation resource has led to resource deterioration, social conflicts, and inadequate manpower in some areas. As a result, Corps managers and planners need information concerning resource carrying capacities and user preferences for various facilities and activities. Recreation behavior, however, is not a static phenomenon. Thus, managers and planners also need to be able to observe trends in recreation preferences and behavior patterns over time. This paper describes current and proposed information systems developed to assist Corps personnel in monitoring such trends.

CORPS OF ENGINEERS INFORMATION SYSTEMS

Figure 1 represents the functional relationships among the various information sources and systems that influence the Corps-wide recreation programs. The arrows denote directions of information flow. Figure 1 represents the conceptualization upon which this paper was based. Thus, further discussion will focus on each of the elements of this figure. Actual data will be presented where appropriate to exemplify the types of recreation trend information being monitored.

CORPS-WIDE RECREATION PROGRAM

The Corps-wide recreation program includes all elements ranging from the individual projects and OCE are two more administrative layers, the Districts and the Divisions. There are 10 Divisions in the contigious 48 states with several Districts in each Division.[4] For this discussion, the pertinent line function running through OCE to the Divisions, to the Districts, and finally to the projects is the Recreation Resource Management Branch (RRMB). In OCE, personnel in this Branch are primarily

---

[1] Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2] Dr. Propst is on temporary assignment under the terms of an Intergovernmental Personnel Act Agreement between the Waterways Experiment Station and Virginia Polytechnic Institute and State University, Blacksburg, VA 24061.

[3] A standard unit of use consisting of a visit by one individual to a recreation development or area for recreation purposes during any reasonable portion or all or a 24-hour period.

[4] The one exception to this generalization is the New England Division, which has no Districts.

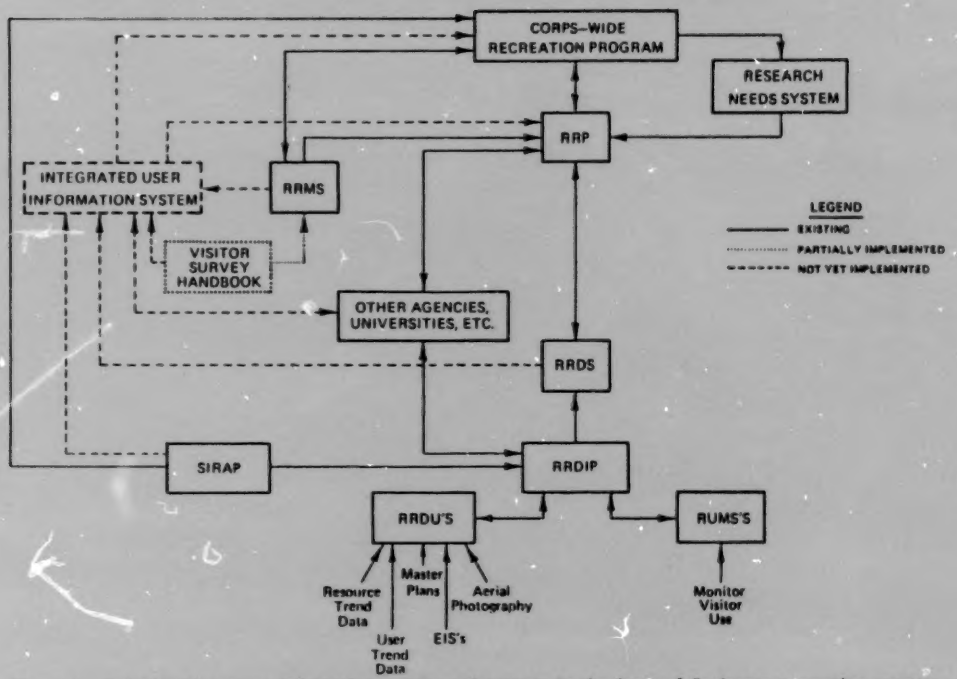


Figure 1. Relationships among information sources and systems in the Corps of Engineers recreation program (arrows denote direction of flow of information). Acronyms are defined in the text.

involved with developing field guidelines, storing and retrieving data, and disseminating information. Personnel in the RRMB's of the Districts and Divisions are involved with developing field guidelines, but also have duties in recreation planning and operations. Personnel at the project level have the responsibility for recreation site management and handling daily operations and maintenance functions, which may vary from project to project.

To help solve recreation design and management problems and to formulate policy, the Corps-wide recreation program receives information from a wide variety of sources. Three of the existing (solid line) sources are illustrated in Figure 1. First, the System of Information Retrieval and Analysis for Planners (SIRAP) was developed by OCE to assist District and Division planners. The SIRAP is a computerized system containing such census and population data as income and employment, demographics, city and county information, and economics.

Second, the Recreation Resource Management System (RRMS) is an automated system for processing recreation data for each project having an annual visitation of 5,000 recreation days of use or more. The RRMS provides for the entry, annual update, scheduled reporting, and manipulation of standardized data fields. The RRMS contains over 450 project variables ranging from monthly visitation counts to the number of unpaved road miles. The data presented in the introductory paragraph of this paper are examples of the types of information found in the current RRMS data files. OCE manages this system, using its contents for nationwide reports and for providing data to other agencies, organizations, and individuals. Field elements (i.e., project, District and Division personnel) not only enter data into the RRMS but also use such data to help make planning and management decisions. This two-way flow of information is represented by the double-pointed solid line in Figure 1.

Third, the Corps-wide recreation program receives information from the Recreation Research Program (RRP), an element administered by the Corps' Waterways Experiment Station in Vicksburg, Mississippi. The RRP is composed of personnel with expertise in recreation planning and design, resource management, park administration, economics, research design, and social sciences.

RECREATION RESEARCH PROGRAM

An important mission of the RRP is to conduct research, the results of which are re-

sponsive to the needs of field personnel. To ensure that this goal is achieved, OCE implemented a Research Needs System for all Corps research elements, including the RRP. According to the Research Needs System, anyone in the Corps can submit for review a problem which he or she feels needs to be researched. Once each year these problems are reviewed by the field and are prioritized. Generally, those problems receiving the highest ratings are funded for research. Thus, the RRP usually conducts research only on high-priority field problems.

To carry out its research and information transfer functions, the RRP receives information from a wide variety of sources that included OCE, Corps field elements, the RRMS data base, other agencies, universities, and private organizations. Once research on a given topic is completed, the results are disseminated to the field in a form suitable for implementation. Success of the RRP is measured primarily by the use of research findings rather than by the production of reports and publications. However, the RRP also produces technical reports and publications for distribution to OCE, Corps field elements, other agencies, and universities.

The RRP does not directly input data into the RRMS but may, through research, influence the methods of data collection at the project level and the types of information which the RRMS contains. For instance, Mischon and Wyatt (1979) of the Midwest Research Institute produced "A Handbook for Conducting Recreation Surveys and Calculating Attendance at Corps of Engineers Projects" for the RRP. The need for such a handbook grew out of the recognition that each Corps District and project had essentially developed its own procedures for collecting visitation data for the RRMS. Other major problems included using outdated load factors, double-counting recreation vehicles within a project, and disregarding proper sampling procedures. The new handbook offers a standarized methodology for counteracting these and other problems. Errors in collecting visitation data have not been entirely eliminated because numerous projects and Districts have not yet implemented the new procedures (dotted line in Fig. 1). However, as the handbook becomes more widely used, visitation figures entered into the RRMS should become much more reliable than in the past.

RECREATION RESEARCH AND DEMONSTRATION SYSTEM

As stated previously, the RRP conducts research on field-related problems. Those problems of highest priority are funded for research by OCE and administered by the RRP as work units to be completed by a specific date. Examples of such work units include "Cost Efficiency of Methods of Operating and Maintaining Corps Recreation Areas" and "Planning and Design Standards for Recreational Roads and Sanitary Facilities". Another work unit, of primary concern to this paper, is the Recreation Research and Demonstration System (RRDS).

The RRDS was initiated in October of 1978 with some of the following goals:

a. To monitor national and regional trends in the quantity and nature of use of Corps recreation resources and the biological, physical, economic, and social impacts associated with such use.

b. To serve as a focus for research and testing in all recreation and natural resource subject areas for which the Corps has responsibility.

c. To provide outdoor laboratories where new methods, structures, designs, and management techniques can be tested and results demonstrated.

d. To meet the requirements of as many of the RRP work units as possible.

e. To attract research interest on the part of other federal agencies, state agencies, universities, and other research organizations.

f. To draw the understanding and support of those Corps operating elements which the RRDS is designed to serve.

To meet these goals, the RRDS is composed of 25 Recreation Research and Demonstration Units (RRDU's) and 9 Recreation Use Monitoring Stations (RUMS's). With only one exception, all components of the RRDS are administered by the Corps. The exception is Lake Amistad National Recreation Area, which is under National Park Service (NPS) jurisdiction. The locations of the RRDU's and RUMS's are shown in Figures 2 and 3, respectively. Each RRDU and RUMS is either an entire Water Resources Development Project or an officially designated portion of such a project.

Projects included in the RRDS were selected to be representative of a wide range of geographic, biological, physical, social, administrative, and operational conditions found at Corps projects nationwide. A primary rational for the establishment of the RRDS is that individual research projects will be able to utilize and in turn contribute a common data base, thereby realizing savings both in

Figure 2. Locations of Recreation Research and Demonstration Units.

Figure 3. Locations of Recreation Use Monitoring Stations.

time and money.

The RUMS's include such Corps projects as ocean jetties, waterways, and harbors. One reason for including the RUMS's as part of the RRDS is that they are not included in the RRMS. Thus, annual Corps of Engineers visitation data do not include the tremendous use incurred at some jetties, waterways, harbors, and other such developments. One future task of the RRP is to develop a methodology for visitation trends at areas such as these RUMS's where access is not tightly controlled.

The RRDU's include the conventional multi-purpose reservoirs, navigational reservoirs with locks, dry reservoirs, modified natural lakes, and local flood-protection reservoirs. Detailed recreation data on each of the RRDU's is contained within the RRMS data base. However, such data are not available on a trend basis. That is, the RRMS contains the current year's data only. Each year the data from the previous year are erased from the computer files, thus making the chronological comparison of trend data difficult and inefficient.[5] It is for this reason that the RRP staff is currently attempting to develop special forms, identify key variables, and implement an automated system for monitoring national and regional trend information.

RECREATION RESEARCH AND DEMONSTRATION INFORMATION PROGRAM

As Figure 1 indicates, the RRP staff administers the RRDS, and in turn the RRDS is supported by the Recreation Research and Demonstration Information Program (RRDIP). Briefly, RRDIP is a program for the systematic collection, storage, manipulation, retrieval, and display of detailed information concerning the 25 RRDU's and 9 RUMS's.

For purposes of classification, the data contained in the RRDIP are divided into five components: natural, man-made, economic, social, and institutional environments. To stratify the data even farther, four geographic divisions were chosen: within project boundary, physical impact zone, economic impact zone, and recreation market zone. The combination of five components and four geographic divisions results in a matrix of 20 primary cells, the basic conceptual framework for RRDIP. Of course, there are substantial differences in the types and quantity of data that will occupy each cell. Some of the cells await the results of ongoing and future research.

The following steps are necessary for making the RRDIP operational:

a. Develop RRDU catalogs

b. Analyze District file information

c. Fill in gaps in the RRDIP data cells

d. Routine management of the RRDIP.

The first step, development of RRDU catalogs, has already been completed. The initial catalogs were limited to existing information primarily from maps, master plans, environmental impact statements (EIS's), SIRAP, other agencies, universities, and a recreation facilities inventory conducted by the RRP staff in the summer of 1979. The data are cataloged according to the 20 data cells previously described and are bound in large loose-leaf notebook for ease of addition and revision. These catalogs of information are available for loan to researchers as they are needed. If funds become available, some of the data in these catalogs may be computerized, thereby increasing the ease of access. Similar catalogs for the RUMS's are not yet available.

Once key variables are identified and final methodologies are chosen, both resource and user trend data will be continual additions to the catalogs. Preliminary methodologies now being tested along with some user trend data are presented below.

The second step, analysis of District file information, has also been completed. During this step, the RRP staff obtained from each RRDU additional information such as aerial photography and reproducible drawings of recreation-area developments. Some of this information has also been incorporated into the RRDU catalog data cells. Another product of this analysis was the identification of those cells with significant gaps in data.

The third step will consist of filling in gaps in the RRDIP data base with the results of ongoing or future research. A major source of such results will be the RRP work units. Results generated by other Corps elements, other agencies, and universities will also be incorporated into the RRDIP catalogs.

The final step is routine management of the RRDIP data base. Included in this step will be such tasks as shifting from manual to computer processing of some of the data elements, redefining some of the data cells if necessary, and adding new information to the data cells.

The primary objective of the RRDIP is the support of research and demonstration; the

[5] However, it is expected that from this year forward, historical data will be retained in the RRMS.

primary users are intended to be researchers. However, the RRDIP is obviously not oblivious to field needs. The RRDIP catalogs are made available to District and project personnel as aids in administering the RRDU's. Moreover, many of the RRP research work units will use the RRDIP data to find better ways to plan and manage Corps recreation and other natural resources. Third, the trend information to be gathered will be of value to Corps planers, managers, and policy makers at all levels.

MONITORING OF TREND DATA

One of the objectives of the RRDIP is to "accept regularly generated measurements of key factors of the recreation and related natural resources environment and to report these data in timely fashion as trend information". To meet this objective, members of the RRP staff began a pilot recreation monitoring program during the summer of 1979 at selected campgrounds within the Lake Ouachita (Arkansas), West Point (Georgia/Alabama), and Shenango (Pennsylvania) RRDU's. The monitoring program was designed to select sample areas and to test a proposed recreation use-impact monitoring methodology.

Vegetation and Soil

One field test consisted of sampling various parameters of soil and vegetation in order to establish a data base for subsequent sampling. These parameters included vegetative species composition, growth habits, percent coverage, and erosion. In addition, permanent photo plots were established, and litter (trash, paper, etc.) counts taken at each sample location. Since this first effort resulted in the establishment of a data base, it will require additional testing before any meaningful conclusions can be drawn. Additional methodological tests are planned for the summer of 1980.

Campsite User Impact

Another concern of this pilot monitoring program was how to monitor effectively the number of recreation days of use per campsite, type of equipment brought to the site by users, and occupancy preference. Accurate information to assess the effects of recreation visitors on the environment is extremely important to the success of the monitoring program.

Although the Corps of Engineers already uses a standardized campground receipt form at each of its fee camping areas, the information derived from the form was not detailed enough to be of substantial value. The RRP staff concluded that a supplementary campsite registration form (Fig. 4), completed by the campground gate attendant, would be the most effective method of recording needed data and should be tried on an experimental basis. Most of the requested information would be obtained from observation, with the exception of zip codes and time departure.

RECREATION RESEARCH PROGRAM

USER IMPACT MONITORING PROJECT

CAMPSITE USE RECORD

RECREATION AREA _____ SITE NO. _____

DATE IN _____ TIME ( ) AM ( ) PM

DATE OUT _____ TIME ( ) AM ( ) PM

ZIP CODE _____

NO. IN GROUP _____

EQUIPMENT - CAMPING:	EQUIPMENT - OTHER THAN PRIMARY MOTOR VEHICLE:
( ) TENT	( ) SECOND CAR/TRUCK
( ) POP UP	( ) MOTORCYCLE
( ) PICK-UP CAMPER	( ) BOAT
( ) TRAILER	( ) TRAILER
( ) R V	( ) BICYCLE

Figure 4. Initial supplementary campsite registration form.

Initial Findings

The initial phase of the user impact study has been completed, and the data obtained from the supplementary registration forms have been compiled (Table 1). One major finding which emerges from Table 1 is the preponderance of the use of tents over other types of camping equipment in two of the three RRDU's. This finding is somewhat clouded by the fact that some camping groups possessed more than one type of equipment (e.g., a pickup camper and a tent). This is why the column percentages adjacent to "camping equipment" add up to more than 100. Future recording forms (to be discussed later) will distinguish between groups with more than one and groups with only one type of camping equipment. Other notable results include the large percentage of second vehicles at all three campgrounds and the relatively high percentage of bicycles. All these findings have direct planning and management implications, especially when the same data are collected over a period of several recreation seasons and significant trends are identified.

Table 1

Recreation Variables Monitored at Three Corps Campgrounds During the Summer of 1979 as Part of the Pilot Recreation Use Monitoring Program[a]

Variables Monitored	Amity		Denby Point		Shenango		Total	
	No.	%	No.	%	No.	%	No.	%
Camping Equipment[b]								
Tent	283	28	83	56	155	50	521	36
Pop-up Camper	140	14	18	12	29	9	187	13
Pick-up Camper	127	13	38	26	42	14	207	14
Camping Trailer	371	37	22	15	38	12	431	30
RV[c]	145	14	20	13	45	15	210	14
Other Equipment[d]								
2nd Vehicle	328	33	46	31	126	41	500	34
Motorcycle	20	2	5	3	15	5	40	3
Boat	450	45	86	58	65	21	601	41
Bicycle	110	11	12	8	51	17	173	12
No. Camping Groups	1,003.00		149.00		309.00		1,461.00	
No. Camping Visitors	3,397.00		584.00		1,293.00		5,274.00	
Avg. No. Persons/Group	3.39		3.92		4.18		3.61	
No. Rec. Days Spent/Group[e]	3,983.00		594.00		872.00		5,449.00	
Avg. Length of Stay/Group (in Rec. Days)	3.97		3.99		2.82		3.73	
Total Rec. Days Spent[f]	13,846.00		2,330.00		3,646.00		19,462.00	

[a] The three campgrounds and dates of monitoring were: Amity Campground (West Point Reservoir), 14 May-3 September; Denby Point Campground (Lake Ouachita), 20 June-3 September; and Shenango Camping Area - Phase IV (Shenango Reservoir) 24-30 May, 1-14 July, and 20-22 July.

[b] Percentages represent the number of groups utilizing a particular type of camping equipment. Column totals exceed 100 percent because, in many cases, each group had more than one type of camping equipment (e.g., a tent and a trailer).

[c] Vans were recorded in the RV category.

[d] Column totals are less than 100 percent because not all groups possessed some type of other equipment.

[e] A recreation day is a visit by one person during any portion or all of a 24-hour period. These figures were determined by summing across all groups the number of entire and partial days each group stayed.

[f] For this table, total recreation days spent were determined by multiplying the number of camping visitors by the average length of stay per group.

The advantages of such a monitoring program are numerous. The additional information generated by the use form will be beneficial to both RRDU planners and resource managers. For instance, some of the data could be used for economic demand modeling and predicting visitor use without the added burden of having to fund and administer a special survey.

Comparison of several years' data with such secondary data as nationwide sales of recreational vehicles will provide a reliable basis for identifying both national and local trends in recreation use patterns, information that is lacking in most Corps District Offices.

Revised Registration Forms

One disadvantage of the form shown in Figure 4, the inability to separate groups with more than one type of equipment from those with only one, has already been discuss-

ed. Another disadvantage was that there were not enough categories for all the different types of equipment being use. For these reasons, this special-use form has been revised (Fig. 5) and will be further tested in other Corps-operated fee campgrounds during the summer of 1980.

PROJECT _____ DATE _____

CAMPSITE USE RECORD

REC AREA _____ SITE NO. _____ ZIP CODE _____

NO. IN GROUP_____ LENGTH OF STAY _____

IS THIS YOUR PRIMARY DESTINATION _____ OR STOPOVER FOR LONGER TRIP _____?

HOW MANY TIMES DID YOU VIST THIS AREA LAST YEAR? _____

PRIMARY VEHICLE

( ) CAR
( ) TRUCK
( ) VAN
( ) MOTORHOME (INCLUDES CONVERTED BUSES)
( ) OTHER _____

EQUIPMENT (CAMPING)

( ) TENT
( ) POP-UP TRAILER
( ) VAN
( ) PICKUP CAMPER
( ) TRAVEL TRAILER

EQUIPMENT (NONCAMPING)

( ) SECOND CAR/TRUCK (NON 4 WHEEL DRIVE)
( ) 4 WHEEL DRIVE VEHICLE
( ) SAILBOAT
( ) CANOE/KAYAK/RAFT
( ) POWERBOAT
( ) BOAT TRAILER
( ) BICYCLE
( ) OTHER _____

Figure 5. Revised supplementary campsite registration form.

The amount of extra paperwork to be performed by the gate attendants, often retired couples working on a contract basis, was considered in the derivation of the forms. The collection of the information for the original form (Fig. 4) did not prove to be overly burdensome during the recent pilot test; thus, the expanded form (Fig. 5) is not expected to pose any serious problems, especially as gate attendants become accustomed to its use. In addition, a detailed set of instructions and definitions will accompany the new form, thereby eliminating some of the uncertainties that the gate attendants face in categorizing types of equipment and other information.

Another form for recording use data besides the forms shown in Figure 5 will also be tested during the summer of 1980. This form is simply a standard IBM computer card that has perforations for each number in each column. Instead of someone keypunching the data onto IBM cards, gate attendants will use a stylus to punch out the perforated sections in the card. For ease of location, the names of all the variables shown in Figure 5 will be printed above the appropriate columns. If gate attendants find this procedure simple enough it will have the added advantage of saving one step in the data coding process.

TREND MONITORING AND THE ENERGY SITUATION

The RRDIP will be of obvious value to planners and resource managers. However, as previously stated, a primary purpose of the RRDIP is to support research and demonstration. The user-impact monitoring program now being tested provides one good example of how the RRDIP will benefit researchers.

At the beginning of the current fiscal year, the RRP staff began research on a new work unit concerning the effects of the energy crisis on the Corps recreation program. The objectives of this work unit were (1) to determine changes in visitation patterns resulting from the increased cost and decreased availability of motor fuel and (2) to determine the regional and local impacts of such changes on facility and personnel requirements.

To meet the work unit objectives, the RRP staff planned to establish trends for several visitation parameters including origin, destination, frequency, duration, type of equipment used, and group size. However, it was soon apparent that either these data were of poor or unknown quality or, in most cases, simply did not exist and would be too expensive or time-consuming to collect. Therefore, a recommendation has been made to stop progress on this work unit, prepare a report summarizing secondary data sources (e.g., U. S. Trend Data Center) indicative of trends, and redefine the goals of the work unit so that it may be successfully completed at a later date. The point is that implementation of the RRDIP, with its inherent capabilities for collecting, storing, and monitoring trend data, will enable a study of this nature to be conducted in only several months and will produce more reliable data at a considerable savings in cost.

DEVELOPMENT OF AN INTEGRATED RECREATION USER INFORMATION SYSTEM

By now the reader should be impressed with

the fact that, within the Corps of Engineers recreation program, there are a wide variety of information systems that contain information from diverse sources and serve many different clients. By themselves, these systems cannot, nor were they intended to, serve the needs of every possible user. For example, the RRMS contains only a portion of the recreation information required by Corps planners and managers. This is because the RRMS was originally designed to support appropriations requests. Once fully operationalized, the RRDIP will contain much detailed information from many different sources besides the RRMS. However, the RRDIP will be based entirely upon a small but fairly representative sample of Corps projects, not the entire system. The need to integrate all the available sources of data into one supplemental user information system and the means of implementing such a system are found in a report prepared for the RRP by Midwest Research Institute (Mischon and Wyatt, 1978).

The relationship of this integrated user information system to existing systems and administrative elements is shown in Figure 1. As indicated by Figure 1, the integrated user information system would be a large, computerized data-management program that interfaces data from the RRMS, RRDS, SIRAP, other agencies, universities, and research organizations. The system would be interactive and capable of responding to the needs of field personnel, the RRP, researchers, and other agencies. One important aspect of the system would be the continual input of annual data regarding recreation use patterns. Such information would enable Corps personnel to spot changing leisure patterns and forecast the effects of these trends. Once implemented, this system would simplify the monitoring of such phenomena as the effects of the energy crisis on visitation.

SUMMARY

A good deal of text in this paper was devoted to a discussion of the functional elements in Figure 1. However, a total picture of all Corps recreation information sources and systems was required to indicate where recreation trend data will be collected and utilized by various Corps elements. Such a discussion was also felt necessary because of the relative newness of the Corps' Recreation Research Program and its associated work units.

The Corps-wide recreation program is composed of OCE's Recreation Resource Management Branch and corresponding line elements in the field (i.e., Division, Districts, and water resources development projects). The RRP has no line authority over the field but exists in a different chain-of-command as an element whose primary function is to conduct field-applied research and disseminate results in a useable form. To ensure that Corps research elements, such as the RRP, conduct only field-applied research, OCE developed a Research Needs System. Through this system, the RRP receives funding for only those research work units given high priority ratings by the field.

One of the first work units for which the RRP was given responsibility was the Recreation Research and Demonstration System (RRDS). The backbone of this system consists of 24 Recreation and Research Demonstration Units (RRDU's) and 9 Recreation Use Monitoring Stations (RUMS's) selected to be representative of Corps' projects nationwide. The data system supporting the RRDS is called the Recreation Research and Demonstration Information Program (RRDIP). A major purpose of the RRDS is to identify key variables indicative of recreation trends and then to develop appropriate methodologies for monitoring such trends. One method of monitoring developed campground use, the supplemental form shown in Figure 4, has received limited field testing. Problems that were identified during initial testing led to the development of a new form (Fig. 5) to be tested at a number of campsites in the summer of 1980. Major advantages of these forms include a heavy reliance on observation for filling out the forms and the generation of reliable data that can be used to document national, regional, and local recreation trends needed for planning and management purposes.

Another work unit, the effects of fuel shortages and prices on visitation, was used as an example of the need to collect reliable trend data. It was concluded that development and implementation of methodologies for monitoring trends at the 25 RRDU's will make the completion of this and other work units more efficient in terms of reliability, time, and dollars spent.

The need for a central location for the interfacing of recreation use data from a wide variety of sources led to the recommendation and plan for an integrated user information system. This is the only element of Figure 1 not yet implemented. Again, a primary function of this system will be to monitor trends in recreation use. However, the integrated user information system will contain data from the entire Corps recreation program, not just the 25 RRDU's, and from various secondary sources not currently being used by the RRDS. Such a system will be of obvious benefit to both researchers and field personnel.

LITERATURE CITED

Mieshon, Raymond M. and R. Chris Wyatt. 1978. Development of improved Decision-Oriented Recreation User Information System. Technical Report R-78-2, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

_____. 1979. A Handbook for Conducting Recreation Survey and Calculating Attendance at Corps of Engineers Projects. Technical Report R-79-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Abbey, Robert V., 1979. Pilot Recreation Area Monitoring Project: Preliminary Results. Unpublished Report. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Coughlin, Robert E., David Berry, and Pat Cohen. 1978. Modeling Recreation Use in Water-Related Parks. Technical Report R-78-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Headquarters, Department of the Army. 1977. Recreation Resource Management System. Engineering Regulation 1130-2-414, Washington, D.C.

Propst, Dennis B. 1980. Impact of Energy Crisis on Corps of Engineers Recreation Program: A Status Reprot. Unpublished Memorandum for Record. U.S. Army Waterways Experiment Station, Vicksburg, MS.

FORECASTING TRENDS IN OUTDOOR RECREATION ACTIVITIES ON A MULTI-STATE BASIS[1]

Vincent A. Scardino
ABT Associates Inc.

Josef Schwalbe, Ph.D.
ABT Associates Inc.

Marianne Beauregard
ABT Associates Inc.

INTRODUCTION

Since a substantial amount of recreation planning takes place on a statewide basis, it is essential to have reliable information and forecasts of recreational needs on a state level. However, most of the recreation research over the last few years have used either national survey data, statewide data or site specific information. Each of these methodologies has severe limitations for projecting recreation participation on a statewide basis. Information based on national surveys, due to lack of a sufficient number of observations per state, can provide only limited information regarding recreational patterns for individual states. Alternatively, state survey efforts lack a uniform survey methodology by which results from several states can be compared. Thus, survey results from several states, unless the data were collected as part of a larger effort, can not be used to forecast the necessary interrelationships and travel patterns among neighboring states which are essential for understanding state recreational patterns. Finally, site specific data can only be used to forecast recreation at isolated sites, although such results have been used to project participation at similar sites.

Clearly, what is needed are methods for projecting recreational behavior on a regional basis so that planners from individual states, can take account of changing patterns and desires from neighboring states which will affect participation in their own states and vice versa. Only by incorporating the complex set of interactions among states can planners in any particular state obtain an accurate picture of recreational participation within his/her own state.

The research effort described below represents one of the few attempts at regional recreational modeling for the New England and New York region.[2] The states are, for the most part, geographically small. The area contains both heavily urbanized centers and rural areas. There are large topographical differences within easy traveling distance offering a wide variety of recreational activities within the region; these, and other reasons, imply that recreationists may easily travel among neighboring states. To accurately understand and project recreational trends within the region, and more importantly for individual states within the region, some form of regional model is essential. The model that was developed will be shown to be a flexible tool capable of forecasting several dimensions of recreational participation as well as spatially distributing participants throughout the region. This paper is divided into three sections: The first section describes the forecasting model; the second summarizes the steps and input data necessary to run the model; the last section presents results for 1985 for two recreation activities, Swimming in Salt Water and Hiking and Wilderness Camping.

DESCRIPTION OF THE FORECASTING MODEL

The model used to project recreation in the New England-New York area was developed by ABT Associates, Inc. under contract to the Commonwealth of Massachusetts to analyze current outdoor recreation patterns within the region and to advance the state-of-the-art in

[1] Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2] Other regional models exist for the Pacific Northwest region.

regional recreational forecasting.[3] The model that was developed, while being a very flexible analytic tool, is specific to the New England-New York area, although the methodology is generalizable to all regions of the country.[4]

Overall, the model is capable of forecasting recreational participation for sixteen different activities;[5] for each activity the model can predict the number of user days of overnight trips and day trips. In addition, the model can also disaggregate activity days into the total number of participants, the frequency of participation and the duration of participation (duration of participation, in activity days applicable only for overnight trips). Finally, the model makes each of these projections by activity, for subregions within the New England-New York region and distributes the resulting participants from any given subregion to each of the remaining subregions within the entire area.

In total there are 79 regression equations in the forecasting model for the 16 different summer outdoor recreation activities. The forecasts for each activity are divided into forecasts for day trips and overnight trips. The distinction between overnight and day trips is stressed because it is felt that the underlying dynamics between the two types of trips are different. Day trips usually involve less travel than overnight trips and usually involve participation in fewer activities. In contrast, for overnight trips the primary goal is the participation in a recreational trip, rather than a single or few well-defined activities. Thus, there are far more combinations of activities engaged in during an overnight trip and it is more difficult to relate a single overnight outing to a single activity.

One of the important goals of the forecasting model was the ability to project recreational participation from subunits of the entire region and then allocate the participation from each subunit to the remaining areas. Thus, the whole study area was divided into 15 geographic subregions so that movements from origins to destinations could be analyzed.[6] Participation was, therefore, projected on a subregional basis for each activity and the resultant activity days originating in each subregion were distributed to all the 15 possible destinations. It is important to note that the 15 subregions are both potential origins and destinations for each activity (for both overnight and day trips). It is also important to note that the model is restricted to forecasting activity participation for only those participants originating from within the region; the model is capable of estimating the number of recreationists that leave the subregion but is not able to project the number and destination of participants that enter the region from elsewhere.

The actual structure of the model is described in Exhibit 1. The model is divided into a day trip model and an overnight trip model,[7] and is estimated for the most part separately for each activity. For both types of trips, day trips and overnight trips, the model is further disaggregated into seven equations, three equations for day trips and four equations for overnight trips, which separately estimate several parameters of participation and together determine total number of activity days at each possible destination within the subregion.[8]

Each of the main equations of the model provide different information thought to be important for recreational planning purposes. The are:

- the probability of participation in a given activity during a given summer

---

[3] For a detailed description of the model, see the ABT Associates report Analysis and Computer Modeling of Summer Outdoor Recreation Activities in the Northeast. Only a general overview of the model is presented in this paper.

[4] Eastern New York was combined with New England to comprise a region because there is obviously a great deal of travel between New York and New England.

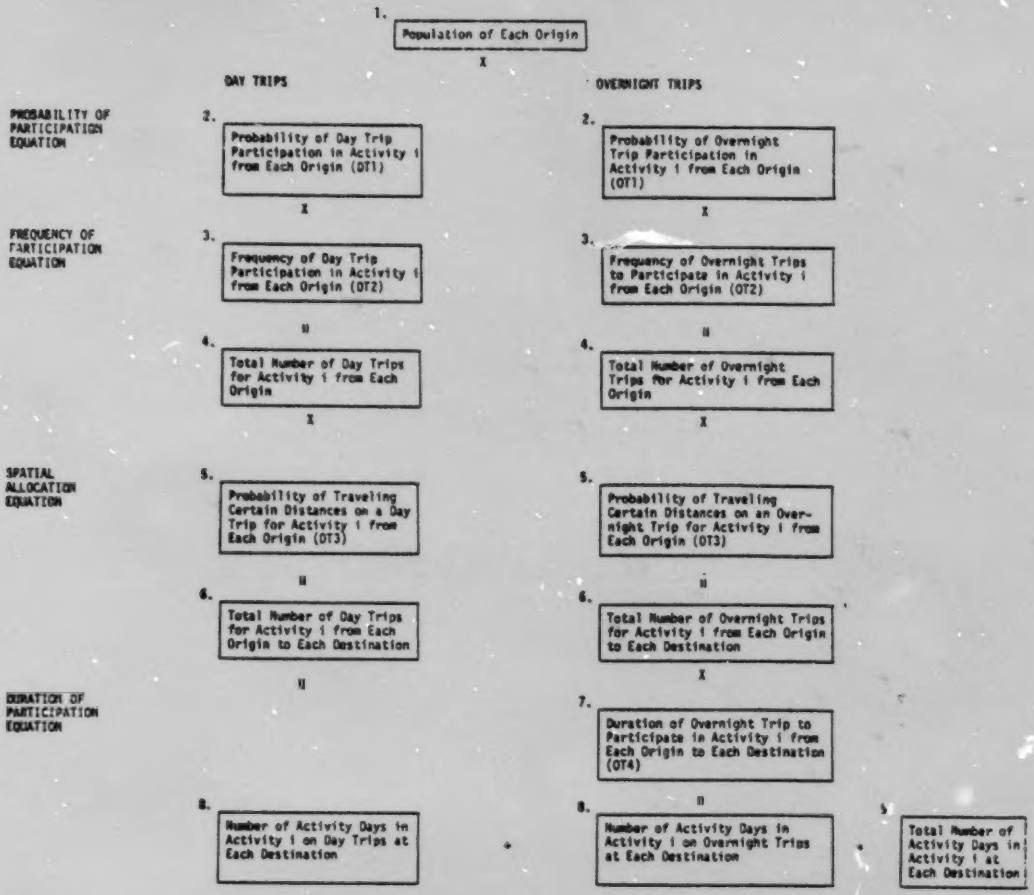
[5] The sixteen activities are Swimming in Outdoor Pools, Swimming in Fresh Water, Swimming in Salt Water, Hiking and Wilderness Camping, Campground Camping, Tennis, Golfing, Bicycling (for pleasure), Canoeing, Sailing, Power Boating, Nature Walks, Fishing, Sightseeing (by motor vehicle), Visiting Fairs, Zoos and Amusement Parks, and Watching Outdoor Sports.

[6] The breakdown of the entire region was done by state, with representatives from the individual states determining the subregions which best suited their needs.

[7] For the most part the equations for day trips and overnight trips are estimated separately, although some linkages do exist since day trip variables are used in the overnight equations.

[8] It is important to realize that the output of the model is measured in activity days. An activity day is defined as the occurrence of participation, by an individual, in a given activity during a single day. Thus, it is possible that several activity days can occur in a single 24 hour period. The model, therefore, does not project the actual amount of time engaged in for an activity. Rather, it predicts the number of occurrences, measured as an activity day, of participation.

EXHIBIT 1: OVERVIEW OF THE MODEL


1.
Population of Each Origin
X
DAY TRIPS
OVERNIGHT TRIPS
PROBABILITY OF PARTICIPATION EQUATION
2.
Probability of Day Trip Participation in Activity i from Each Origin (DT1)
2.
Probability of Overnight Trip Participation in Activity i from Each Origin (OT1)
X
FREQUENCY OF PARTICIPATION EQUATION
3.
Frequency of Day Trip Participation in Activity i from Each Origin (DT2)
3.
Frequency of Overnight Trips to Participate in Activity i from Each Origin (OT2)
=
4.
Total Number of Day Trips for Activity i from Each Origin
4.
Total Number of Overnight Trips for Activity i from Each Origin
X
SPATIAL ALLOCATION EQUATION
5.
Probability of Traveling Certain Distances on a Day Trip for Activity i from Each Origin (DT3)
5.
Probability of Traveling Certain Distances on an Overnight Trip for Activity i from Each Origin (OT3)
=
6.
Total Number of Day Trips for Activity i from Each Origin to Each Destination
6.
Total Number of Overnight Trips for Activity i from Each Origin to Each Destination
X
DURATION OF PARTICIPATION EQUATION
7.
Duration of Overnight Trip to Participate in Activity i from Each Origin to Each Destination (OT4)
=
8.
Number of Activity Days in Activity i on Day Trips at Each Destination
8.
Number of Activity Days in Activity i on Overnight Trips at Each Destination
=
9.
Total Number of Activity Days in Activity i at Each Destination

- the frequency (the number of separate occurrences) of participation within a given season for a given activity

- the spatial allocation between where a recreation trip originates and where it culminates

- the duration (measured in activity days) spent participating in particular activity (applicable only to overnight trips).

The first three equations are estimated separately for day trips and overnight trips; the fourth equation is applicable only to overnight trips. All equations are activity specific, except the last two overnight trip equations which are trip specific since it was found to be impossible to separate out the individual influences of specific activities from the decision to take an entire trip.

Again referring to Exhibit 1 the linkages can be described.

The first output of the model is the determination of the total number of trips originating at each origin (Box 4). This is accomplished in two steps. The first step estimates the probability of a person, at a specific origin, participating in a given recreational activity (Box 2). The second equation, using only those who have participated in a given activity, determines the number of trips they take (Box 3).

These equations are used to predict total trips from each origin. If values of the independent variables from each origin are inserted into the two equations, the probability and frequency of participation from each origin can be predicted. This information is combined with the population of each origin, and total number of trips from each origin is obtained by multiplying the three values.

Once estimates of the total number of trips from each origin are obtained, the

second part of the model allocates the total trips among the various destinations (Box 6).[9] The last equation of the model, applying only to overnight trips, estimates total number of activity days per overnight trip at a given destination.

The output at this stage is an equation predicting total number of activity days for a given activity (Box 7). When the total number of activity days from day trips is combined with the total activity days on overnight trips, the total number of activity days for a given activity has been estimated for a particular destination (Box 9).

Once the population is known, multiplying the first equation by population determines total number of participants in that activity for day trips and overnight trips. Multiplying that quantity by the output of the second equation determines the total number of activity trips for that activity and type of trip. The third equation takes the total number of activity trips and distributes them among the various destinations. Finally, the last equation predicts the number of days of participation for each activity on overnight trips.

In summary, using all the equations, the model can predict the total number of activity days from a given origin to any number of destinations for day trips and overnight trips. Taken individually, recreational planners can use any of the equations to predict a given component of total participation; either the probability of participation, frequency, spatial allocation or duration.

The equations of the model were estimated using various regression techniques using two types of data; primary survey data which contains socio-demographic data and trip specific data obtained via a telephone survey conducted by ABT Associates in 1977 and secondary data describing characteristics of each subregion and the supply information for each activity.[10] The primary data obtained via ABT Associates' Summer Activities Survey provided the key participants and non-participants for each activity. The survey was conducted during the September of 1977 using a multi-stage stratified random sample of individuals 12 years or older, living in the New England-New York region. The entire region was stratified into 15 geographic subregions -- corresponding to the subregional breakdown used to determine the spatial allocation of participation--and separate samples were drawn from each stratum. In total there were 1541 completed interviews, or approximately 100 interviews from each subregion.

Information regarding the aggregate characteristics of each subregion and supply data relevant for individual activities was obtained from the Commonwealth of Massachusetts. Unfortunately, the secondary data proved to be far less consistent or reliable than the primary data and therefore its usefulness was limited.[11] It was originally felt that such supply information would be valuable determinants of participation, especially when accounting for differences in participation among the various subregions. Thus, these secondary data were originally intended to be used as independent variables in each of the forecasting equations. However, due to data inconsistencies and a great deal of missing information, an alternative formulation was developed whereby a separate supply model was developed and

---

[9] The spatial allocation portion of the model is a relatively complex algorithm which projects the distribution of participation on the basis of the probability of traveling a given distance from an origin of known characteristics to a destination of known characteristics. The basis for these estimates is a multi-nomial logit model which was used to project the probability of traveling certain distances for each activity by day and overnight trip, based on the characteristics of the individual origin and destination. For a more detailed description see Volumes 2 and 5 of ABT's report, Analysis and Computer Modeling of Summer Outdoor Recreation Activities in the Northeast and Documentation for the Summer Outdoor Recreation Forecasting Model respectively.

[10] Supply data refers to physical characteristics associated with each subregion that is necessary for participation in the various activities. Thus, number of ocean beaches would be a supply variable for Swimming in Salt Water while number of 18 hole golf courses in a subregion would be a supply variable for Golfing.

[11] The problems with the supply data were lack of consistent definition or method of collection across subregions and, most importantly, too many missing observations. In fact, there were a sufficient number of missing observations that it was not possible to use the supply data directly in the model.

linked to the main forecasting model.[12]

The dependent variables in each equation were taken from the primary data collected by ABT Associates. For the first equation, the probability of participation, respondents were categorized into two groups for each activity, and for overnight and day trips, and the dependent variable was whether or not they were in the group participating in that particular activity. For the second equation the number of different instances of participation of those respondents who participated in a given activity, separately for overnight and day trips, was used as the dependent variable. For the spatial allocation component of the model the probability of traveling a specified distance for a given activity was estimated and used as part of a more complex spatial allocation algorithm. Finally, for the fourth equation, which was estimated only for overnight trips, the number of different activity days of participation on a given trip over all activities was used as the dependent variable.

Most of the key independent variables of each equation were general socio-demographic information and specific activity trip information.[13] For the most part both types of data were obtained from the ABT Summer Activities Survey. In using the model to make predictions the user must only estimate values for the independent variables that are expected to change over time, input them into the model, and assuming that a number of other underlying relationships will be maintained over time, the model will predict the various components of recreation discussed above.

Finally, it should be noted that the entire model has been installed as a self-contained, user operated computer model. The computer model has built into it a great number of adjustments that must be made before the output of the individual equations can be used to obtain the desired projections.[14] In addition, the computer model restricts many of the independent variables, primarily the trip specific variables, to default values otained from ABT's Summer Survey. For other variables, unless the user specifies changes, the computer will default to average values used in estimating the model. The user need only specify changes in certain independent variables and the model will print out projections of participation by activity for each subregion in the New England-New York region. An example of the output of the model for one activity and one subregion are presented in Exhibit 2. If total participation for any activity within the region is required then it is a simple matter of aggregating the distribution of participation from each origin.

FORECAST RESULTS

This section presents results of implementing the model to forecast the expected number of activity days to be spent in each subregion in 1985 for two activities--Swimming in Salt Water and Hiking and Wilderness Camping. For this example, 1985 values for population, age, and income were used in the model. All other variables were assumed to remain constant at their 1977 levels.

PROJECTIONS OF EXOGENOUS VARIABLES

Table 1 presents the values of population, age, and income for 1977 and 1985 for each of the 15 subregions. The 1977 population estimates were provided by the states, themselves. The 1977 age and income estimates are the sample means of the ABT survey data. Subregional projections of population, age and income were derived using state estimates published by the National Planning Association (NPA).[15]

The subregional population estimates

[12] For each activity a proxy for the subregional supply characteristics was created based on the survey data. That proxy, which was an index relating activity participation within a subregion to the whole region, was then used as an independent variable in the forecasting model. In addition, a separate supply model was developed which related the actual supply variables to the proxy supply variables. Within the supply model changes in actual supply variables could be used to change the proxy values which would then be changed in the main forecasting model. This indirect technique allows inclusion of supply variables in the forecasting model without the problems of the actual supply variables. Thus, a recreation planner can still determine the effect of changes in a supply variable, for example of golf courses, on participation.

[13] Examples of the independent variables used to estimate the equations are age, income, sex, race, distance travelled, number of people on a trip and other respondent and participant characteristics.

[14] Many of the adjustments convert values in logarithms and back again, make adjustments that were necessary to calibrate the model and in general ease the process of inputing variables into the model.

[15] Scara, Timothy B., David W. Fay, and Joe Won Lee, State and Metropolitan Growth Patterns, 1960-1990, Washington: National Planning Association, Report Number 77-R-1, 1977.

ACTIVITY = HIKING
ORIGIN= W CONN
POPULATION= 1758.00 (THOUSANDS)
ALL ACTIVITY DAYS ARE RECORDED IN THOUSANDS

DAY TRIPS
PROBABILITY OF PARTICIPATION-------> 0.0493
MULTIPLIED BY
FREQUENCY OF PARTICIPATION-----> 10.76364
EQUALS TOTAL # OF DAY TRIPS-----> 932.97

OVERNIGHT TRIPS
PROBABILITY OF PARTICIPATION-------> 0.0697
MULTIPLIED BY
FREQUENCY OF PARTICIPATION-----> 2.93648
EQUALS TOTAL # OF OVERNIGHT TRIPS-----> 359.91

PROBABILITY OF MAKING DAY TRIPS TO THE FOLLOWING DESTINATIONS:

W_CONN	E_CONN	W_MAINE	E_MAINE	MA-CAPE	EAST_MA	WEST_MA	NO_NH	SO_NH	SO_VT	MID_VT	NO_VT	R_I	NO_MI	SO_MI
.74962	0.20979	0.0	0.0	0.00195	0.00468	0.00892	0.0	0.00195	0.0	0.00029	0.0	0.0	0.0	0.0

ULTIPLIED BY THE TOTAL # OF DAY TRIPS MINUS 28.7 ACTIVITY DAYS OUTSIDE THE NY/NEW ENGLAND AREA EQUALS DAY TRIP ACTIVITY DAYS TO

W_CONN	E_CONN	W_MAINE	E_MAINE	MA-CAPE	EAST_MA	WEST_MA	NO_NH	SO_NH	SO_VT	MID_VT	NO_VT	R_I	NO_MI	SO_MI
699.4	195.7	0.0	0.0	1.8	4.4	8.9	0.0	1.8	0.0	0.3	0.0	0.0	0.0	0.0

PROBABILITY OF MAKING OVERNIGHT TRIPS TO THE FOLLOWING DESTINATIONS:

W_CONN	E_CONN	W_MAINE	E_MAINE	MA-CAPE	EAST_MA	WEST_MA	NO_NH	SO_NH	SO_VT	MID_VT	NO_VT	R_I	NO_MI	SO_MI
.18210	0.06030	0.02686	0.01794	0.02989	0.14747	0.05916	0.02808	0.02781	0.07070	0.03454	0.01810	0.03208	0.01810	0.02729

URATION OF PARTICIPATION IN ACTIVITY ON OVERNIGHT TRIPS IS 2.95 DAYS, MULTIPLIED BY THE ABOVE PROBABILITIES MINUS 732.4
CTIVITY DAYS OUTSIDE THE NY/NEW ENGLAND AREA, GIVES THE NUMBER OF OVERNIGHT TRIP ACTIVITY DAYS AT DESTINATION :

W_CONN	E_CONN	W_MAINE	E_MAINE	MA-CAPE	EAST_MA	WEST_MA	NO_NH	SO_NH	SO_VT	MID_VT	NO_VT	R_I	NO_MI	SO_MI
193.5	64.1	20.6	19.1	31.8	156.7	62.9	30.7	29.6	75.1	36.7	19.2	34.1	19.3	29.0

ADDING DAY TRIP ACTIVITY DAYS TO OVERNIGHT ACTIVITY DAYS GIVES THE TOTAL ACTIVITY DAYS AT :

W_CONN	E_CONN	W_MAINE	E_MAINE	MA-CAPE	EAST_MA	WEST_MA	NO_NH	SO_NH	SO_VT	MID_VT	NO_VT	R_I	NO_MI	SO_MI
892.9	259.8	28.6	19.1	33.6	161.1	63.7	30.7	31.4	75.1	37.0	19.2	34.1	19.3	29.0

EXHIBIT 2

TABLE 1. VALUES OF EXOGENOUS VARIABLES - 1977 AND 1985

SUBREGION	POPULATION (in thousands)		MEAN AGE OF POPULATION 12 years and over		MEAN INCOME OF THE POPULATION (in thousands of 1977 dollars)	
	1977	1985	1977	1985	1977	1985
WEST CONNECTICUT	1758.0	1802.0	39.4	39.5	17.391	19.974
EAST CONNECTICUT	1405.0	1440.0	41.8	41.9	15.000	17.430
WEST MAINE	698.0	802.0	43.7	41.8	10.999	12.853
EAST MAINE	300.0	346.0	40.8	39.0	11.627	13.679
CAPE MASSACHUSETTS	990.0	1059.0	41.2	41.1	13.211	15.752
EAST MASSACHUSETTS	3324.0	3555.0	41.6	41.5	16.347	18.750
WEST MASSACHUSETTS	1350.0	1444.0	41.2	41.1	13.327	15.595
NORTH NEW HAMPSHIRE	285.0	321.0	46.3	41.7	12.884	15.128
SOUTH NEW HAMPSHIRE	573.0	646.0	42.6	38.3	14.725	17.266
SOUTH NEW YORK	10447.0	10688.0	40.9	41.9	16.281	18.891
MID NEW YORK	4210.0	4307.0	37.9	38.8	16.947	19.275
NORTH NEW YORK	425.0	435.0	38.9	39.8	13.700	15.833
RHODE ISLAND	1016.0	931.3	40.9	41.0	13.972	16.372
NORTH VERMONT	175.0	182.0	38.9	36.8	13.419	15.930
SOUTH VERMONT	313.0	326.0	43.8	41.4	12.388	14.659

were calculated from the state values assuming that changes at the subregional level were proportional to those at the state level. That is, the distribution of population among subgroups within a given state loss held constant, at its 1977 value.

The NPA report does not publish the mean age of the population, per se. However, the report does include a breakdown of population by age cohort groups for each state. The mean age of the population 12 years old and over of each state was estimated by taking a population weighted average of the cohort groups, 12 years of age and over. Subregional estimates were then calculated assuming that the change for each subregion was proportional to that of its encompassing state.

Mean population income was derived assuming a constant rate of growth among subregions within a state over the 1977-1985 period. The growth rates were calculated based on the NPA's estimates of state per capita income for 1977 and 1985.[16]

FORECASTS OF RECREATION PARTICIPATION

The 1985 projections of population, age, and income were used in the model to derive forecasts of the number of activity days for Swimming in Salt Water and Hiking and Wilderness Camping at each destination in 1985. These forecasts, as well as the corresponding estimates for the baseline year-1977, are presented in Tables 2 and 3 for Swimming in Salt Water and Hiking and Wilderness Camping, respectively. For simplicity, the tables show only the number of activity days resulting from both day trips and overnight trips. Note that these estimates represent the total number of activity days to be expected at each destination by recreation participants originating in the Northeast region.

The forecasts for Swimming in Salt Water (Table 2) suggest that every subregion, except East Connecticut, will experience an increase in the number of activity days spent at that destination. The two subregions in Maine show the largest percentage increases, while Cape Cod in Massachusetts and South New York exhibit the largest absolute changes.

In general, increases in day trips contribute slightly more to increases in the total number of activity days than do changes in overnight trip activity days. In East Connecticut, where visitation is expected to fall (or remain relatively constant at its 1977 level),[17] day trips are estimated to

[16] The actual 1985 income estimates (in thousands of 1977 dollars) were about 5% greater than those shown in Table A. Values used in the model are constrained to $\pm$ 3 standard deviations of the mean. The figures in Table A reflect the upper bound of this constraint and were the values used in deriving the projections.

[17] Given the accuracy of this (or any) forecasting model, a change of 0.5% can not be considered significant.

TABLE 2

FORECAST OF ACTIVITY DAYS FOR SWIMMING IN SALT WATER,

1977 AND 1985 IN THOUSANDS

SUBREGION OF DESTINATION	1977		1985		CHANGE IN TOTAL ACTIVITY DAYS (1985 MINUS 1977)	
	DAY TRIP ACTIVITY DAYS	TOTAL ACTIVITY DAYS	DAY TRIP ACTIVITY DAYS	TOTAL ACTIVITY DAYS	ABSOLUTE	PERCENT*
WEST CONNECTICUT	11,471	22,193	11,655	22,951	758	3.4
EAST CONNECTICUT	11,907	16,491	11,551	16,407	-83	-0.5
WEST MAINE	3,142	9,816	3,643	10,764	948	9.7
EAST MAINE	58	3,195	81	3,427	268	8.4
CAPE MASSACHUSETTS	12,218	16,531	13,137	17,724	1,193	7.2
EAST MASSACHUSETTS	12,465	17,176	13,076	18,082	906	5.3
WEST MASSACHUSETTS	-0-	-0-	-0-	-0-	-	-
NORTH NEW HAMPSHIRE	-0-	-0-	-0-	-0-	-	-
SOUTH NEW HAMPSHIRE	4,713	8,805	5,101	9,478	673	7.6
SOUTH NEW YORK	62,379	69,083	64,206	71,999	2,916	4.2
MID NEW YORK	-0-	-0-	-0-	-0-	-	-
NORTH NEW YORK	-0-	-0-	-0-	-0-	-	-
RHODE ISLAND	10,979	17,342	11,147	17,869	527	3.0
NORTH VERMONT	-0-	-0-	-0-	-0-	-	-
SOUTH VERMONT	-0-	-0-	-0-	-0-	-	-

* Percent Change = (1985 data minus 1977 data/1977 data)

TABLE 3

FORECAST OF ACTIVITY DAYS FOR HIKING AND WILDERNESS CAMPING

1977 AND 1985 IN THOUSANDS

SUBREGION OF DESTINATION	1977		1985		CHANGE IN TOTAL ACTIVITY DAYS (1985 MINUS 1977)	
	DAY TRIP ACTIVITY DAYS	TOTAL ACTIVITY DAYS	DAY TRIP ACTIVITY DAYS	TOTAL ACTIVITY DAYS	ABSOLUTE	PERCENT*
WEST CONNECTICUT	968	3,406	851	3,348	-58	-1.7
EAST CONNECTICUT	679	1,225	666	1,226	1	0.1
WEST MAINE	358	1,514	399	1,637	123	8.1
EAST MAINE	137	636	147	675	39	6.1
CAPE MASSACHUSETTS	317	1,239	303	1,260	21	1.7
EAST MASSACHUSETTS	1,151	2,210	1,095	2,209	-1	-0.05
WEST MASSACHUSETTS	326	836	309	830	-6	-0.7
NORTH NEW HAMPSHIRE	776	1,819	844	1,936	117	6.4
SOUTH NEW HAMPSHIRE	870	1,790	905	1,879	89	5.0
SOUTH NEW YORK	197	1,471	34	1,307	-164	-11.1
MID NEW YORK	1,423	3,750	1,292	3,615	-135	-3.6
NORTH NEW YORK	503	912	476	893	-19	-2.1
RHODE ISLAND	233	1,226	213	1,240	14	1.1
NORTH VERMONT	179	521	180	533	12	2.3
SOUTH VERMONT	705	1,888	710	1,928	40	2.1

*Percent Change = (1985 data minus 1977 data/1977 data).

decline by 356 thousand in 1985; this decrease is partially offset by an increase in the number of overnight trip activity days.

The forecasts for Hiking and Wilderness Camping (Table 3) exhibit much smaller changes from the 1977 baseline than did swimming in Salt Water. Moreover, 6 of the 15 subregions are expected to experience a decline in visitation for Hiking and Wilderness Camping, although in several cases the decrease is too small to be considered significant.

The projections suggest that New York will be the greatest loser of activity days while Maine, New Hampshire and Vermont will be the largest gainers.

The 1985 forecasts suggest that day trips to 9 of the subregions will fall relative to their 1977 level. In three of these subregions--East Connecticut, Cape Massachusetts, and Rhode Island-- the increase in overnight trip activity days more than offsets the decline in day trips, resulting in increases in total activity days.

The differences in the magnitude and direction of the changes between the two activities stem from several sources. First, since population at each origin drives the model, increasing population and holding all variables constant at their 1977 values would result in an overall increase in the total number of activity days for both Swimming in Salt Water and Hiking and Wilderness Camping. However, when age and income are allowed to vary, the overall effect depends upon the signs and magnitude of their coefficients in the various regression equations.[18] Since the relative effects of age and income as measured by the regression coefficients are different for the two activities, changing these variables produce different results.

Secondly, participation in Swimming in Salt Water is very much constrained by natural resources. Only 9 of the 15 subregions have coastal area, limiting the number of possible destinations.

Other Uses of the Forecasting Model

The data generated by the forecasting model are amenable to other kinds of analysis as well. In particular, the model's forecasts can be analyzed in terms of recreationists' travel patterns among the sub-state regions to engage in various kinds of outdoor recreation.

[18] A detailed discussion of the equations is presented in Volume 2 of ABT's report, Analysis and Computer Modeling of Summer Outdoor Recreation Activities in the Northeast.

For a given activity, the model estimates the number of day trips which originate within each subregion, and also estimates the subregion in which the activity actually takes place, that is, the destination.[19]

For most outdoor recreation activities, some residents will remain in their own subregion to participate in the particular activity while other residents will travel to a different subregion. If a greater number of people leave a subregion than enter the subregion to engage in an activity, then that subregion is experiencing a net outflow of participants to other subregions. If more people come into the subregion than leave it, then that subregion is importing participants, that is, there is an inflow of participants for that recreation activity.

Discussion of Day Trip Recreation

Table 4 presents the net inflows and outflows for day trips to participate in Swimming in Salt Water during the summer of 1977. For each of the 15 subregions, the number of day trips (for Swimming in Salt Water) which originated in the subregion is subtracted from the total number of day trips which had that subregion as its destination.

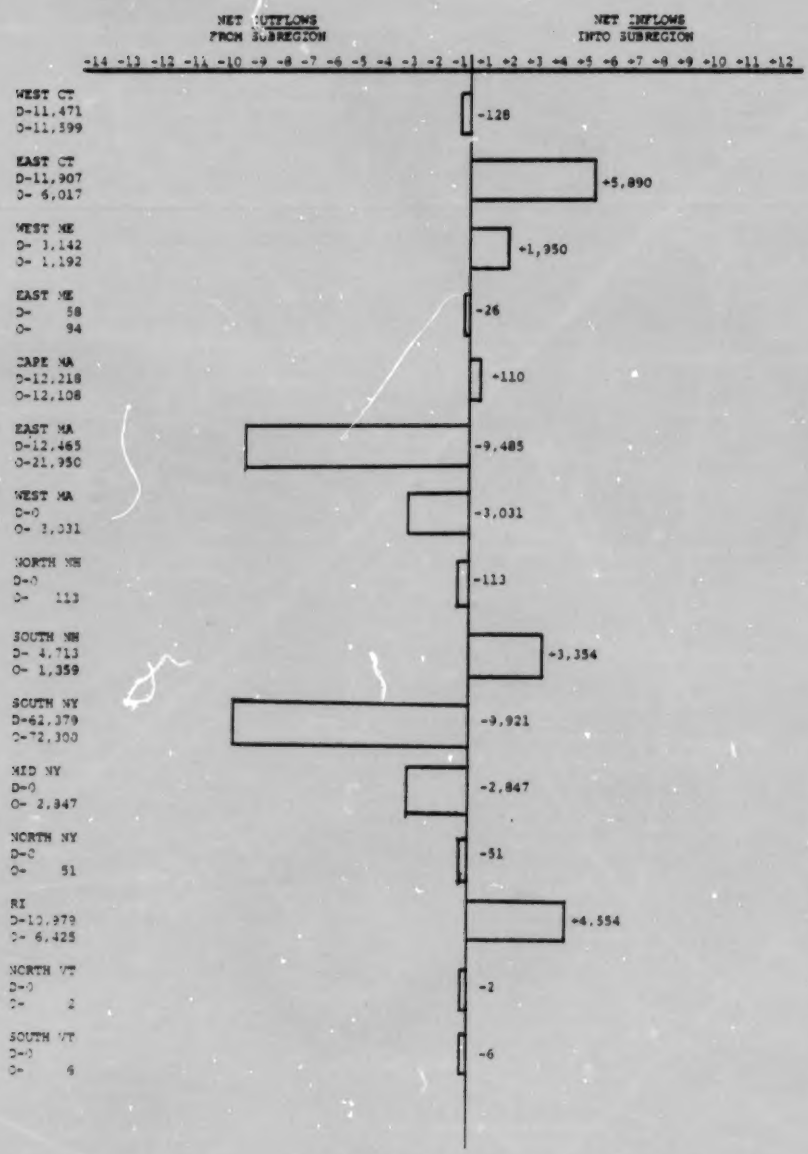
As is noted on the left hand column, residents of West Connecticut took an estimated 11,599,000 day trips to go Swimming in Salt Water during the summer of 1977 (i.e., these day trips originated from this sub-region). Of all the Salt Water Swimming day trips in the New England-New York region, West Connecticut was the final destination for 11,471,000 of these trips. Thus, while most West Connecticut residents remained within their own subregion to participate in this activity, there was a net outflow of 128,000 day trips to places outside of West Connecticut because more people exited from this subregion than entered it from the other 14 subregions. In strong contrast is East Connecticut which experienced a substantial inflow into its subregion for Salt Water Swimming day trips from other parts of the New England-New York region.

For some subregions, of course, there can be no inflow of recreationers to engage in Salt Water Swimming simply because the subregion lacks this natural resource. Thus, subregions such as West Massachusetts, North

[19] Note that the model's estimates of recreation activity at each destination is based on travel from within the New England-New York region only. The model does not provide estimates of recreationists who enter the region from Canada, other parts of the U.S., etc.

TABLE 4

1977 DAY TRIPS (IN 000) FOR SALT WATER SWIMMING



and South Vermont, can only experience outflows to the subregions which have ocean beaches.

Overall, East Connecticut, West Maine, South New Hampshire, and Rhode Island enjoy substantial inflows of recreationers for Salt Water Swimming day trips. Interestingly, both East Massachusetts and South New York experience considerable outflows of day trips for Swimming in Salt Water, even though both these subregions have ocean beaches.

Table 5 presents model projections of day trip activity for Swimming in Salt Water for the year 1985,[20] based upon expected changes in the population, age, and income in the New England-New York region.[21] The data suggest that the subregions will likely continue to exhibit the same basic patterns of either importing or exporting day trip Salt Water Swimming participants for 1985 as they did in 1977, although the size of the inflows and outflows have changed. East Connecticut and Rhode Island are each likely to experience approximately 500,000 more day trips for this beach activity in 1985 as compared to the inflows into these subregions during 1977. Also, the outflow of day trip participants from South New York is likely to be considerably less in 1985; while only slightly more day trips will originate in this subregion, substantially more participants (than in 1977) will be destinating in South New York for Salt Water Swimming day trips.

A similar analysis is presented for day trips to engage in Hiking and Wilderness Camping during 1977. Table 6, which displays the net inflows and outflows for each of the 15 subregions, demonstrates very different patterns than was observed for Swimming in Salt Water. Immediately obvious is the fact that people take far fewer day trips to engage in this activity. East Massachusetts enjoys the largest inflow of day trip participants for Hiking and Wilderness Camping (in strong contrast to its substantial outflows of day trip participants for Swimming in Salt Water). Also noteworthy is the fact that although more day trips for Hiking and Wilderness Camping originate in the Mid New York subregion, it still experiences a strong outflow of such day trips.

Table 7 presents the forecasting model's estimates for 1985 day trips for Hiking and Wilderness Camping. Again, the basic patterns remain although there are slight changes in the magnitude of the inflows/outflows.

[20] Data based on NPA estimates.

[21] As with all forecasting models, the output should not be considered as absolute predictions, but is best utilized by analyzing the relative changes which are estimated under varying assumptions.

Discussion of Total Activity Days

Tables 8 and 9 display the net inflows and outflows in 1977 and 1985 for the total activity days in which people go Swimming in Salt Water. West Connecticut, which exhibited a slight outflow of day trips (see Table 4), now experiences as significant inflow of total activity days; the reversal in flows is accounted for by the fact that this subregion is a popular destination for overnight trips where recreationists participate in Salt Water Swimming. The other coastal subregions also enjoy substantial inflows of participants, with the notable exception of East Massachusetts and South New York which continue to export participants to other areas. A comparison of 1977 and 1985 forecasts (in Tables 8 and 9 respectively) indicate that the same basic patterns will obtain throughout this time period.

Forecasts of the total activity days for Hiking and Wilderness Camping in each subregion for 1977 and 1985 are presented in Tables 10 and 11. West Connecticut, North New Hampshire, and South Vermont have the largest number of total activity days destinating in the subregion (3,750,000 activity days); but considerably more activity days are originating from this part of the state (8,537,000), and thus this subregion experiences a significant outflow of participants.

The data for 1977 in Table 12 focuses on Mid New York and displays the net inflows into the other subregions for Hiking and Wilderness Camping activity days from Mid New York. While other parts of the state are getting some inflow from Mid New York, other subregions--West Connecticut and East Massachusetts, in particular--are the greatest gainers of the Hiking and Wilderness Camping activity days which are outflowing from Mid New York.

CONCLUSIONS

There is considerable travel from one substate region to other subregions in the New England-New York area to participate in various outdoor recreation activities. The total number of activity days originating and destinating in each subregion demonstrate significant flows of recreationists throughout the entire region; this is also true, though to a lesser degree, when day trip activity is analyzed.

Model projections of recreation activity in 1985--based on estimated changes in the average age, income, and population of each subregion--suggest that some changes in magnitude, but not of direction of the subregional inflows and outflows, of recreation activities will occur.

TABLE 5

1985 DAY TRIPS (IN 000) FOR SALT WATER SWIMMING

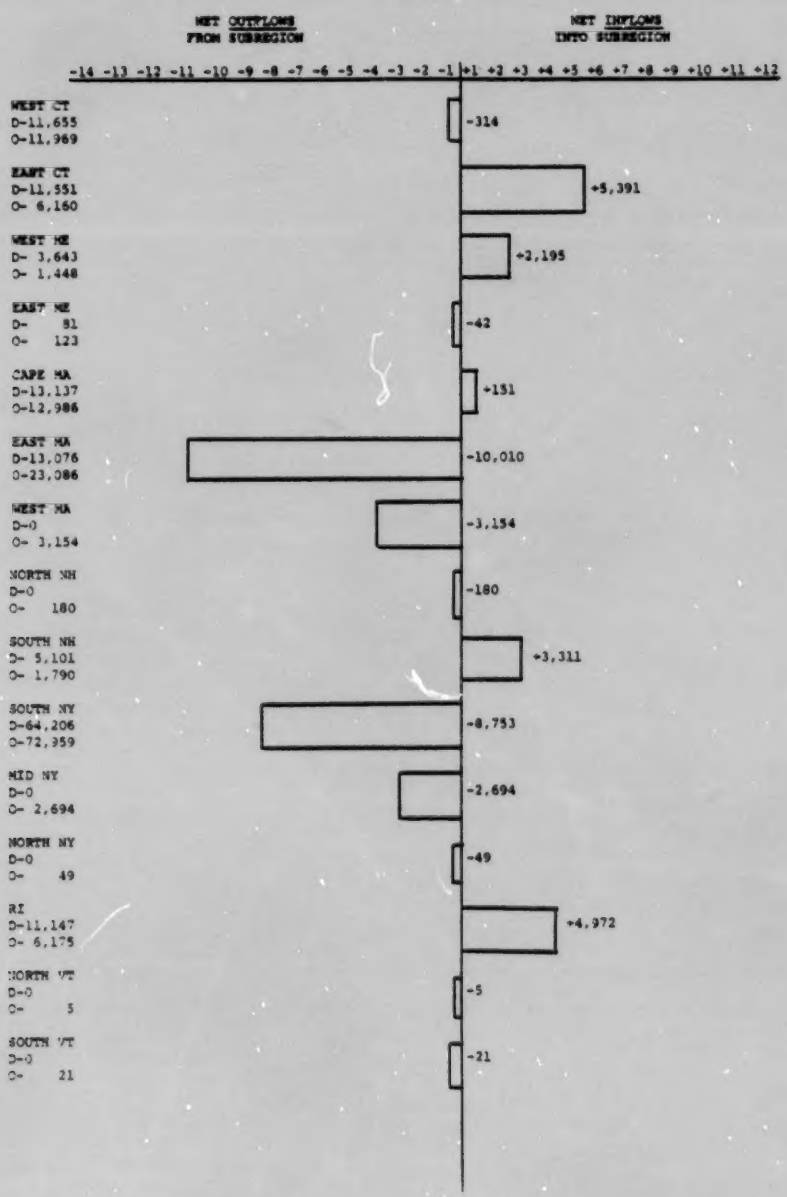


TABLE 6

1977 DAY TRIPS (IN 000) FOR HIKING & WILDERNESS CAMPING

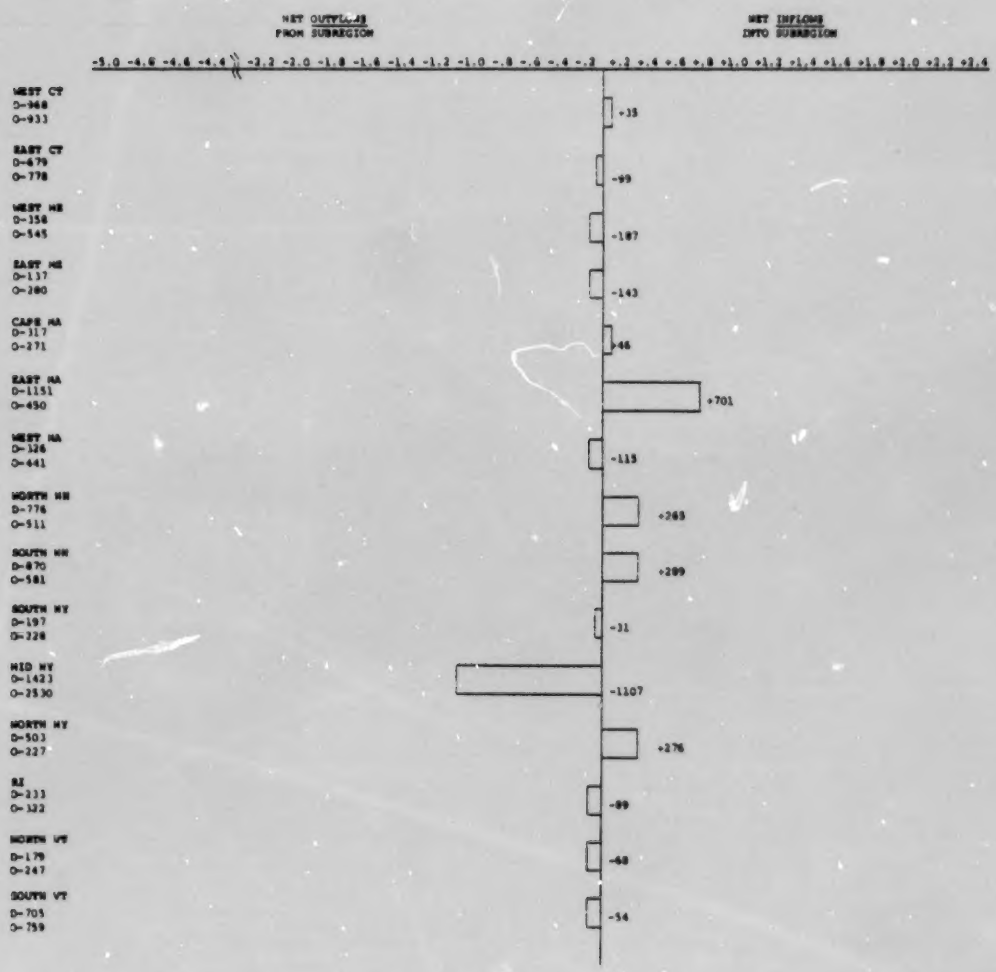


TABLE 7

1985 DAY TRIPS (IN 000) FOR HIKING & WILDERNESS CAMPING

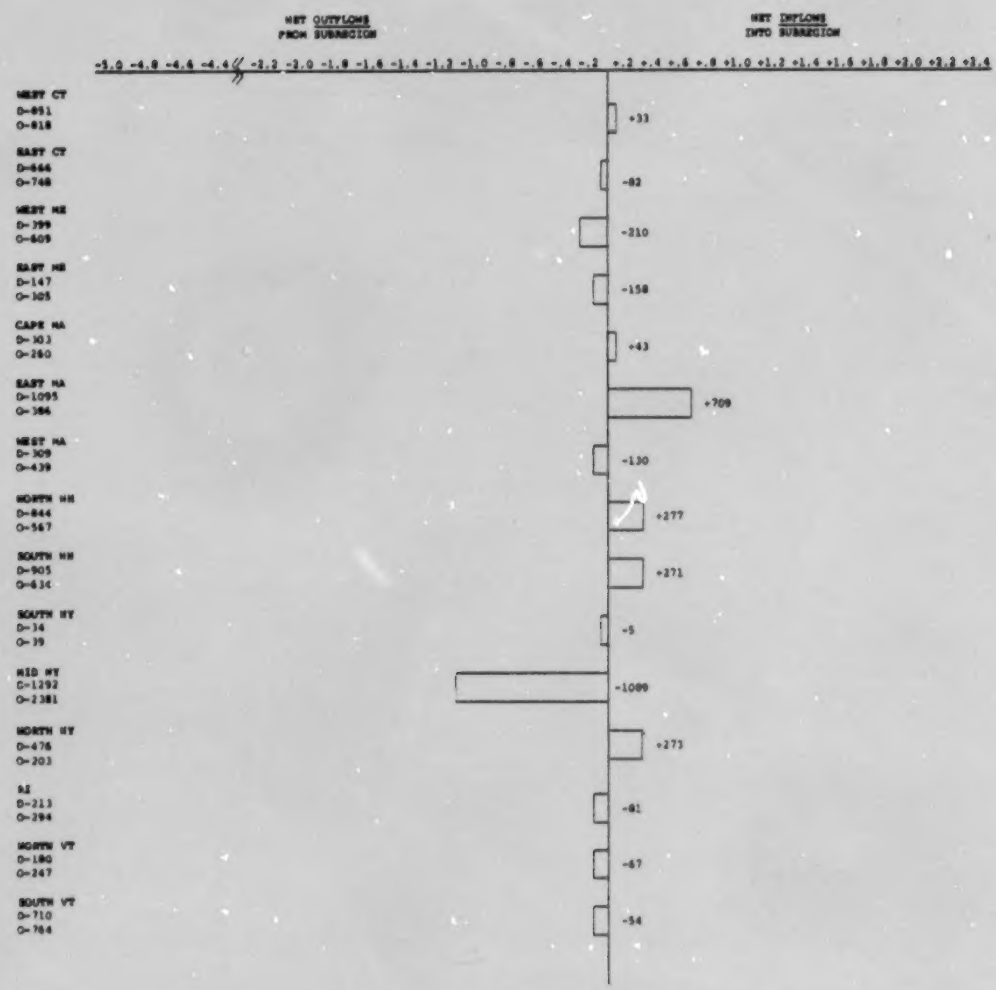


TABLE 8

1977 TOTAL ACTIVITY DAYS (IN 000) FOR SALT WATER SWIMMING

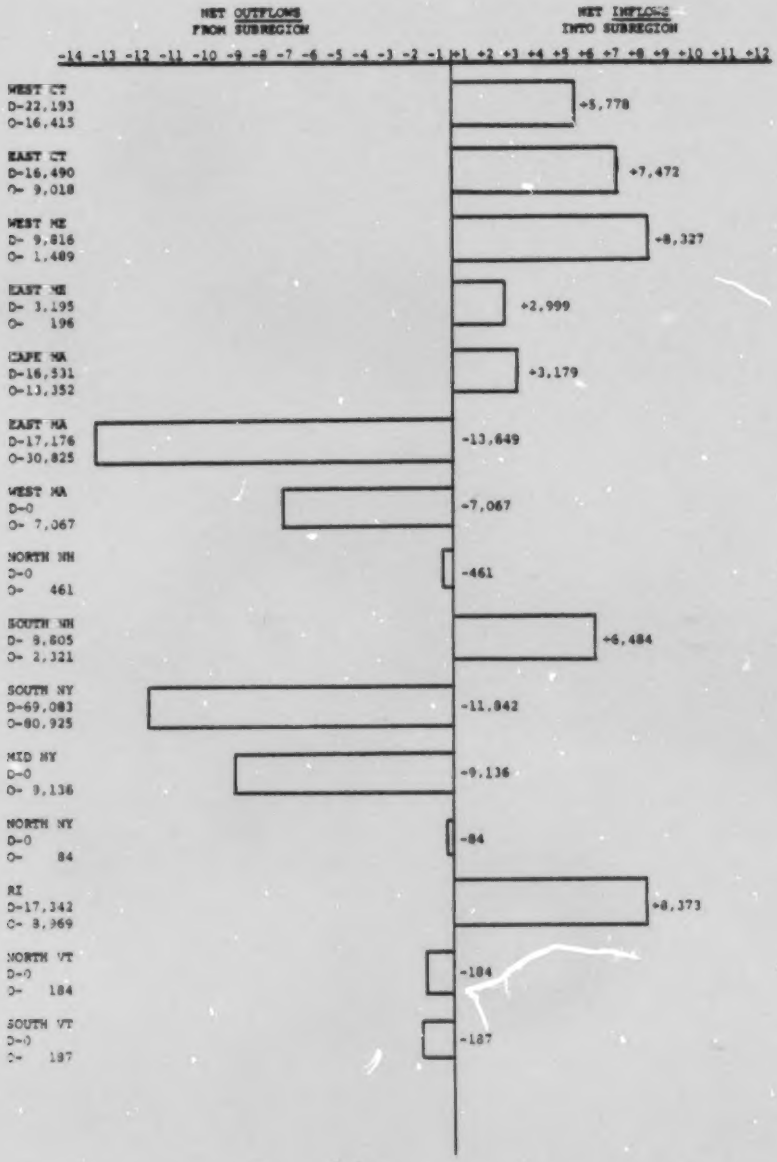


TABLE 9

1985 TOTAL ACTIVITY DAYS (IN 000) FOR SALT WATER SWIMMING

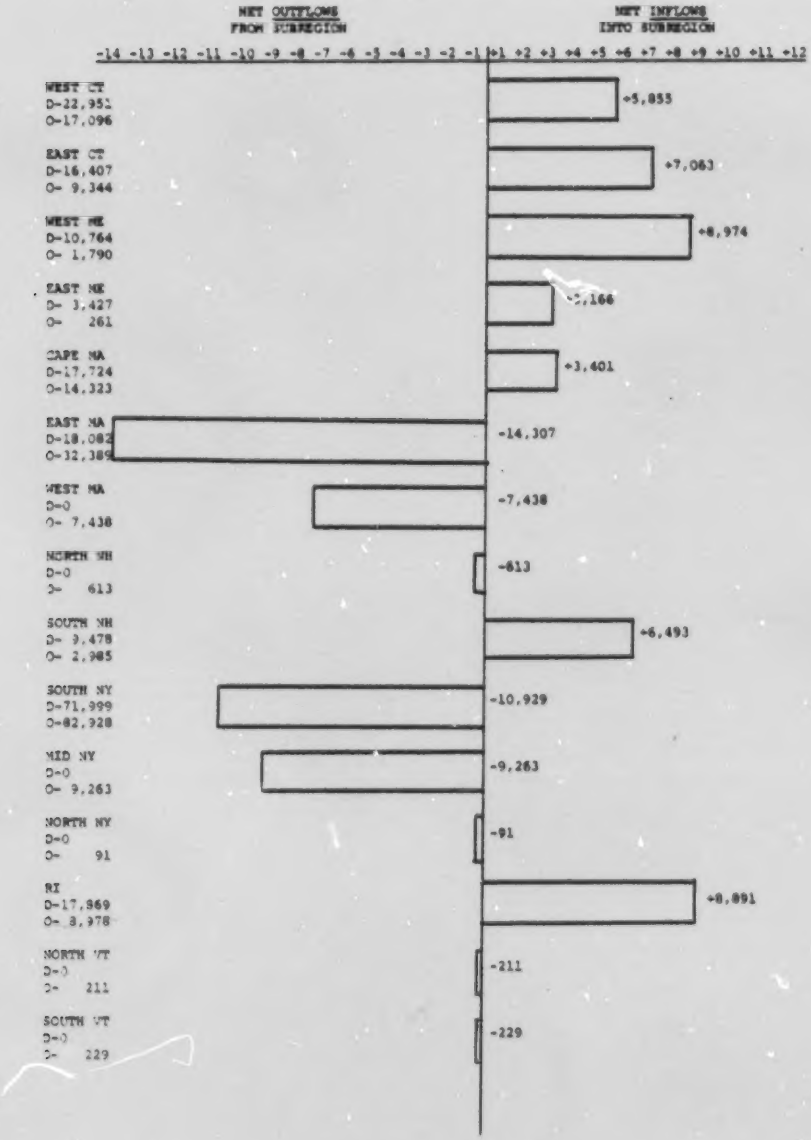


TABLE 10

1977 TOTAL ACTIVITY DAYS (IN 000) FOR HIKING & WILDERNESS CAMPING

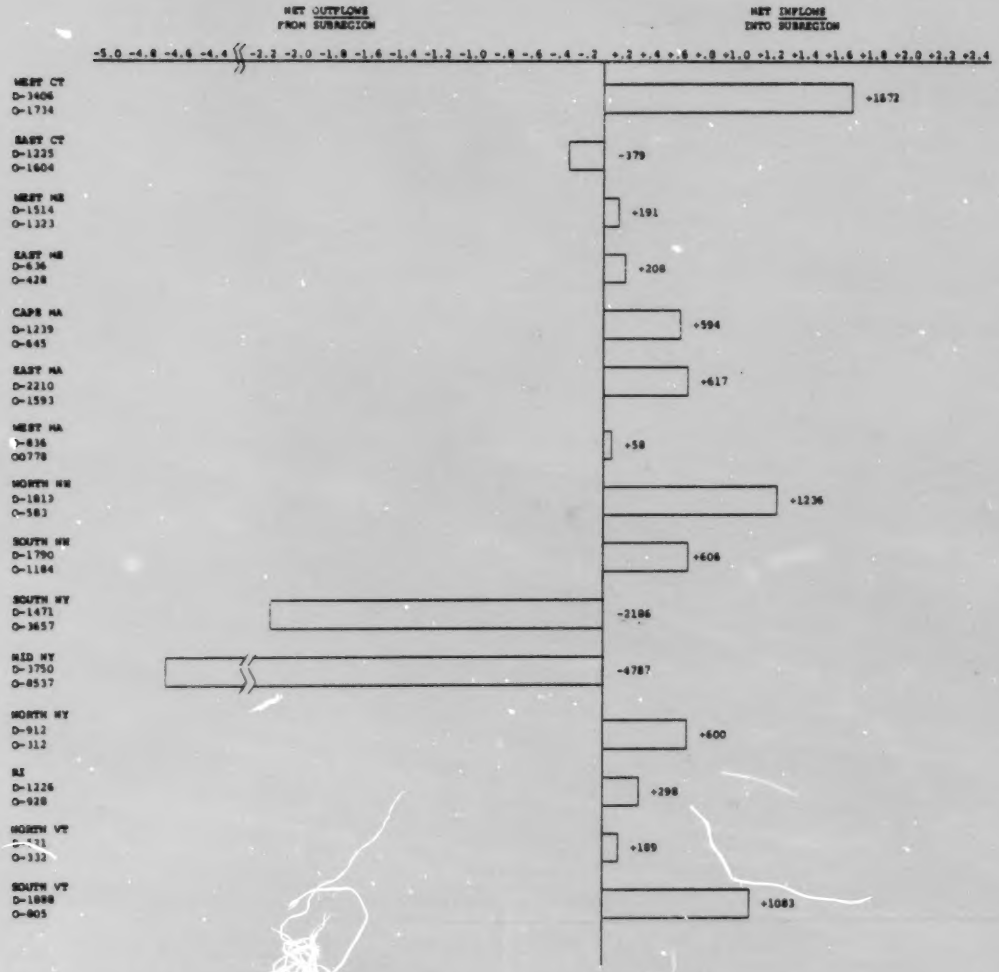


TABLE 11

1985 TOTAL ACTIVITY DAYS (IN 000) FOR HIKING & WILDERNESS CAMPING

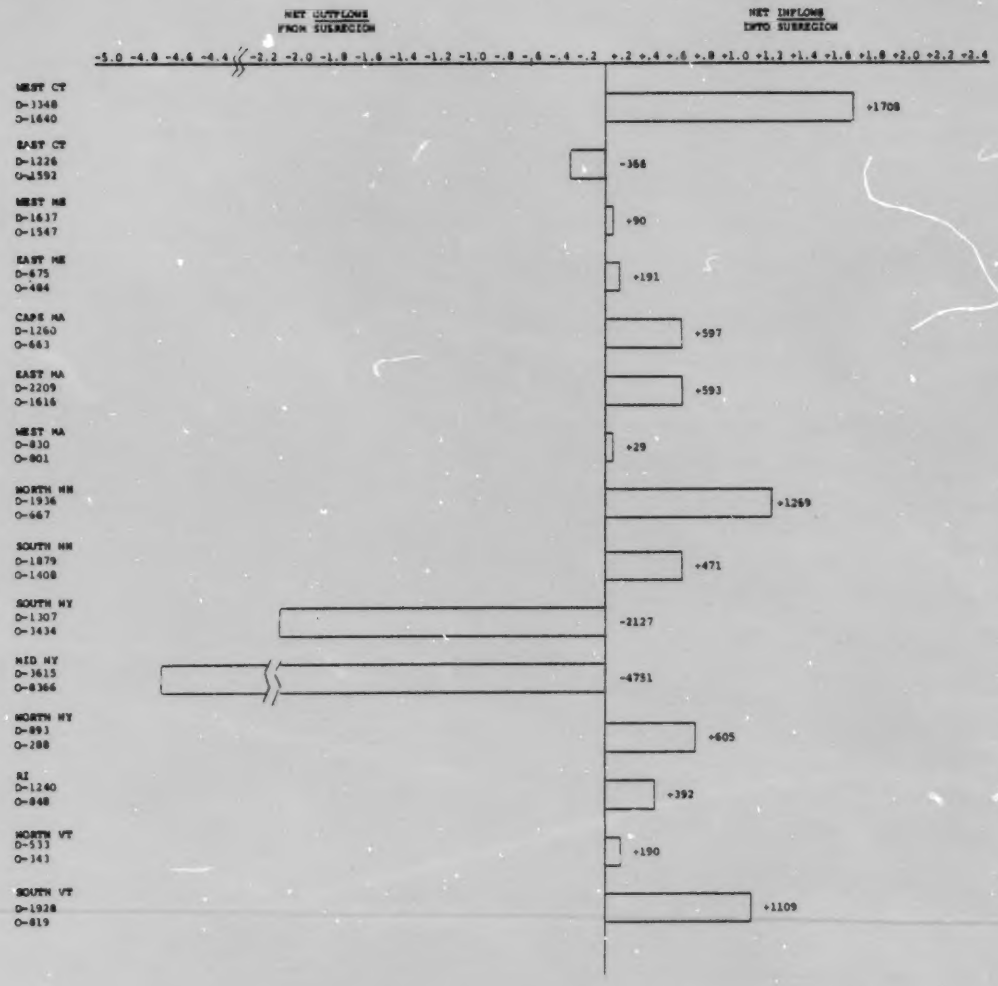
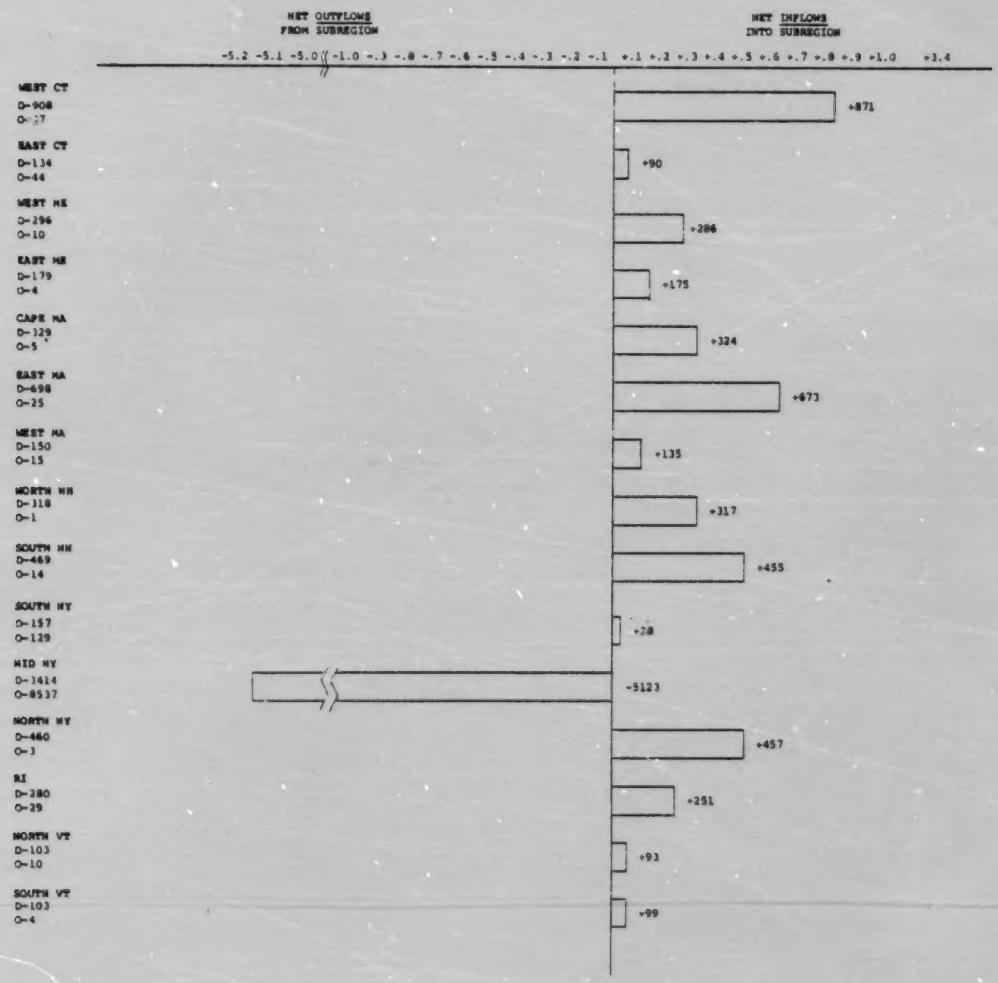


TABLE 12

NET INFLOWS IN OTHER SUBREGIONS FROM MID NEW YORK

(1977 TOTAL ACTIVITY DAYS -IN 000- FOR HIKING & WILDERNESS CAMPING)



A SIMULATION MODEL FOR FORECASTING DOWNHILL SKI PARTICIPATION[1]

Daniel J. Stynes
Department of Park and Recreation Resources
Michigan State University
East Lansing, MI

Daniel M. Spotts
Department of Park and Recreation Resources
Michigan State University
East Lansing, MI

INTRODUCTION

The purpose of this paper is to describe progress in the development of a general computer simulation model to forecast future levels of outdoor recreation participation. The model is applied and tested for downhill skiing in Michigan.

The approach combines a cohort-survival population model with a simple recursive model of skier adoption and dropout decisions. It has been implemented for computer simulation in FORTRAN. Simulations of numbers of skiers (both active and inactive) and their characteristics (age, length of involvement) can be generated for any year between 1950 and 2000. By altering model inputs the user may generate a variety of future scenarios and test various downhill ski promotion and development strategies.

THE APPROACH - COMPUTER SIMULATION

A number of distinct forecasting models have been applied to the prediction of outdoor recreation participation. These are reviewed in Moeller and Echelberger (1974) and Stynes, Bevins, and Brown (1980). Two step linear regression models and simple trend extension methods predominate. Diffusion models (West 1977, Stynes and Szcodronski 1980) and Delphi studies (Moeller et al. 1977) have also been used to predict future participation and characteristics of outdoor recreation activity.

Perhaps the most serious problem with simple analytic forecasting models is their failure to incorporate the time dimension in a meaningful way. The models are mostly static, or at best comparative static. Many are based upon cross-sectional data and do not include dynamic structural features or processes. The models do not therefore work well in a dynamic environment and they generally fail to shed much light upon the processes which underlie trends in outdoor recreation participation.

We argue here that recreation systems are quite dynamic, characterized by timelags, feedback effects, and interactions between variables over time. Understanding of these dynamic processes could yield significant improvements in our ability to forecast the behavior of recreation systems. Simulation models are more suited to the exploration and modeling of such processes.

The Limits to Growth models (Meadows 1972) are perhaps the most widely known applications of computer simulation to futures research. Within recreation, computer simulation models have been applied to planning and management. The Wilderness Travel Simulator (Shechter and Lucas 1978, Smith and Krutilla 1976) and recreation trip distribution models (Cesario 1975, Ellis and Van Doren 1967) are good examples. Ladany (1975) includes a number of simulation models in his collection, Management Science Applications to Leisure Time Operations. More widespread application of these techniques, including forecasting applications, have been constrained by a lack of suitable data bases, lack of needed simulation and modeling skills within recreation, and limited progress in quantification of relationships describing outdoor recreation behavior patterns.

Computer simulation models have several advantages over analytic approaches:

1. They are more realistic, more easily

[1] Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

understood, and more persuasive.

2. They are more flexible - no standard assumptions, easily modified, and lend themselves to a component approach.

3. They treat time in a meaningful way.

4. They permit a wide range of experiments on the model.

5. They "facilitate understanding of complicated systems of relationships relevant to policymaking". (Hamilton 1969)

6. They contribute to theory development, guide research, and pinpoint data collection priorities.

There are, of course, corresponding disadvantages. Model development can be expensive and complex, simulation models often have extensive and unique data requirements, and model validation is not straightforward.

In this case, the lack of good time series data on skiing ruled out a trend extension model. Existing data was scattered, of inconsistent quality, and very limited except for the two years 1968 and 1978. Even this data was not well-suited to estimating the numbers of skiers or the volume of skiing activity in Michigan. Hypothesized errors in the data bases did not recommend a purely "statistical" approach. Limitations in the data would have to be compensated for by a model which captured important structural features of downhill ski participation decisions.

Given the state of knowledge about the ski market and uncertainty about the future, our purpose became one of not so much to forecast the future, but to create a better understanding of the forces likely to affect the future of downhill skiing in Michigan and to permit the testing of alternative actions. The simulation model is designed to be a tool that ski area managers, planners, and marketing personnel might use to better understand the future and to assist in decision making.

A model was desired that could be adapted, extended, and refined as our understanding of the ski market increases and as the variables influencing skier decisions change over time. A secondary purpose of the model is to guide future research and data collection. The potential long-term benefits of a computer simulation model strongly recommended this approach.

MODEL SUMMARY

The forecasting model combines a cohort-survival population model with a similar model of skier adoption, dropout, and readoption decisions. The population component of the model updates the age structure of the population each year based upon estimates of fertility and mortality.

The skier component of the model determines the numbers of persons of each age that are (1) active skiers, (2) inactive skiers, and (3) non-skiers. Active and inactive skiers are further divided by years of experience in downhill skiing. The model is recursive. Rates of adoption, dropout, and readoption are applied to populations in year N to determine the numbers of active skiers, inactive skiers, and non-skiers in year N+1. New adopters are taken from the population of non-skiers and dropouts move from active to inactive status. Readoption rates are applied to the population of inactive skiers to estimate the number returning to active status each year (Figure 1).

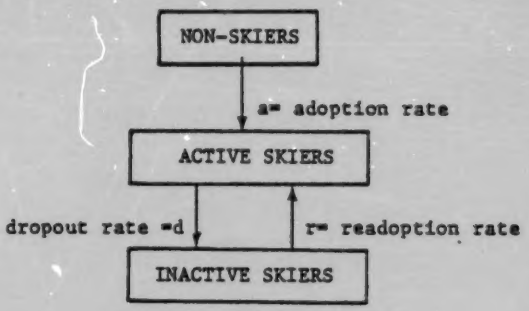


Figure 1. Skier Adoption, Dropout, and Readoption

Adoption, dropout, and readoption rates are all age-specific. This permits the modeling of relationships between family life cycles and ski activity. Age is correlated with income, physical ability, lifestyle, marital status, presence of children of various ages within the household, etc. Thus, age serves as a proxy for a number of variables influencing ski participation decisions.

Dropout rates also depend upon an individual's length of involvement in skiing. Dropout rates are relatively high for first-time skiers and decline with increasing experience in the sport. The model also includes exogenously determined variables that permits the user to adjust adoption and dropout rates over time due to age-independent factors. Entry and exit rates may be altered based upon snow conditions, price increases, travel restrictions, and other variables that have not yet been incorporated into the model. The flexibility in the model

permits the addition of new variables and components in the future.

PARAMETER ESTIMATION

The ski forecasting model consists of two principal components: a population model and a skier decision model. Parameters for the cohort-survival population model are the standard fertility, mortality, and migration rates. The interested reader is referred to Pittenger (1976) and Shyrock (1971) for further details on estimating vital rates for populations.

Our concern here is primarily with the skier decision model. The key parameters are age-specific adoption, dropout, and readoption rates for each year. Existing empirical data is not well-suited to straightforward estimation of these parameters. Time series data to estimate changes in rates over time are totally lacking. Adoption, dropout, and readoption rates were therefore estimated using a variety of both statistical and heuristic techniques. Parameters were first estimated independently. Simulation experiments were conducted and parameters were subsequently adjusted iteratively until model behavior was deemed reasonable and selected model outputs corresponded with empirical observations. Inconsistency in empirical data sets required judgement in selecting those variables to focus upon in statistical fitting porcedures.

Data Base

Parameter estimation and model validation draw upon two primary data bases on Michigan downhill skiers. The first complete data on Michigan skiers is provided by Leuschner (1970) in a survey of the North Central region in 1968. A 1978 Michigan skier market survey (Stynes, Mahoney, and Spotts, 1980; Stynes and Mahoney, 1980) provides the data most suited to development of the forecasting model. These two years of fairly comprehensive surveys are supplemented by national survey data from LaPage (1978) where necessary, and from selected reports of estimates of skier volumes found in Domoy (1977) and Farwell (1977).

The 1978 Michigan skier market survey gathered extensive data on adoption, inactivity, and withdrawal from downhill skiing. Active and inactive skiers were included in the design, and recall questions were used to estimate the age and year of adoption and dropout. This recall data forms the basis for estimation of age-specific adoption and dropout rates overtime. Where data was lacking, product life cycle and related theories were used to fill in gaps.

Adoption Rates

The adoption rate for individuals in age group I for year N is given by a product of two terms:

$$a^N(I) = a_1^N * a_2(I)$$

$a_2(I)$ is the adoption rate for age group I in 1970, i.e., the percent of non-skiers adopting in the year.[2] a_1^N is an exogenously determined adjustment factor permitting the model user to adjust adoption rates over time.[3] Figure 2 plots the recommended values for a_1^N for those years N between 1950 and 1978. These were estimated from Stynes and Mahoney (1980).

$a_2(I)$ are age-specific adoption rates. These were estimated for 1970 by distributing new skiers into three year age groups using an empirical distribution measured by Stynes and Mahoney (1980). The age at adoption was calculated for 503 active and former skiers. The resulting distribution is plotted in Figure 3. These estimates represent skiers adopting between the years of 1946 and 1978 and will to some extent reflect the age distribution of the population over this period. We assume that the age distribution of adopters given by Figure 3 is constant over time and can be applied to any year to distribute new skiers by age. Empirical data supports this assumption.

Dropout Rates

Dropout rates include three components. The dropout rate for individuals age I with J years of experience in year N is given by:

$$d^N(I,J) = d_1(N) * d_2(I) * d_3(J)$$

Dropout rates depend upon the year (N), the age of the skier (I), and the number of years of experience (J). These three components are assumed to be independent and to enter multiplicatively. The assumption of independence between age and length of involvement is clearly invalid, but sufficient data did not exist to estimate a joint relationship of the form $d_4(I,J)$.

---

[2] 1970 was selected as a base year because of fairly accurate estimates for both population (1970 Census data) and numbers of new skiers (estimated from Leuschner 1970, Stynes and Mahoney 1980, and Farwell 1977).

[3] a_1^N for N=1970 should be approximately 1.0. Values of a_1^N larger than one yield higher adoption rates than those observed for 1970, while values less than one yield rates lower than the 1970 standard.

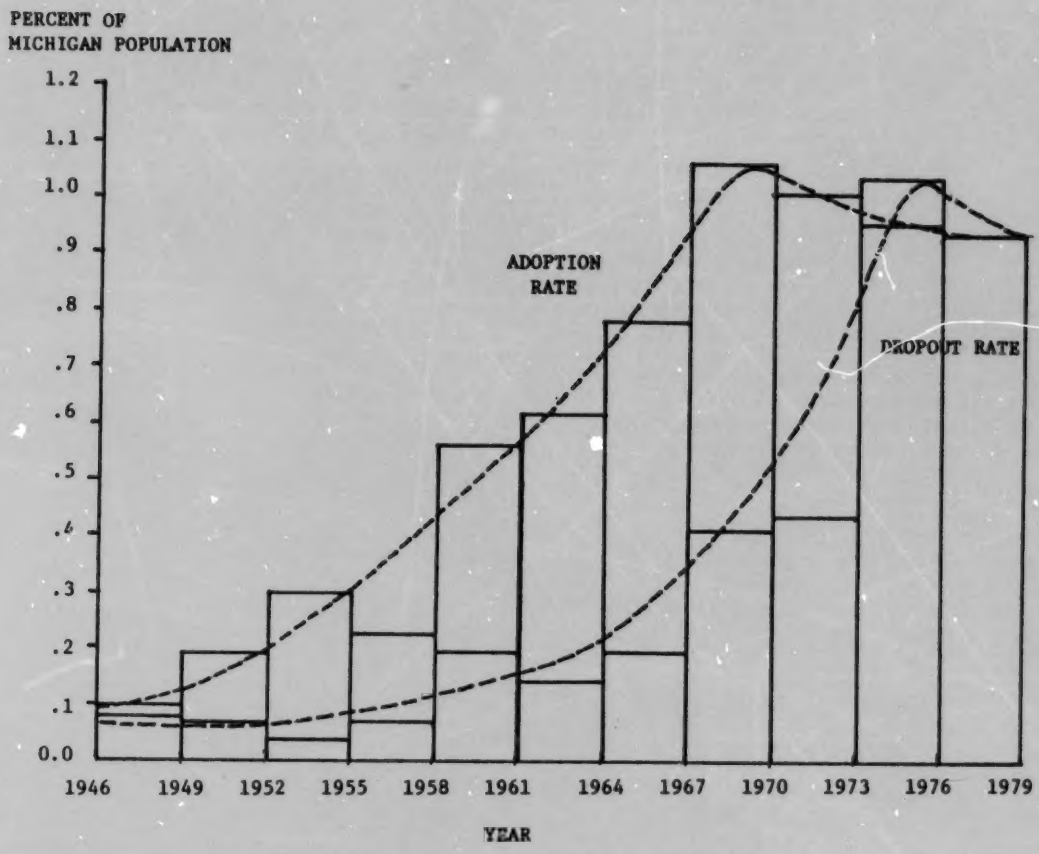


Figure 2. Estimated Adoption and Dropout Rates By Year

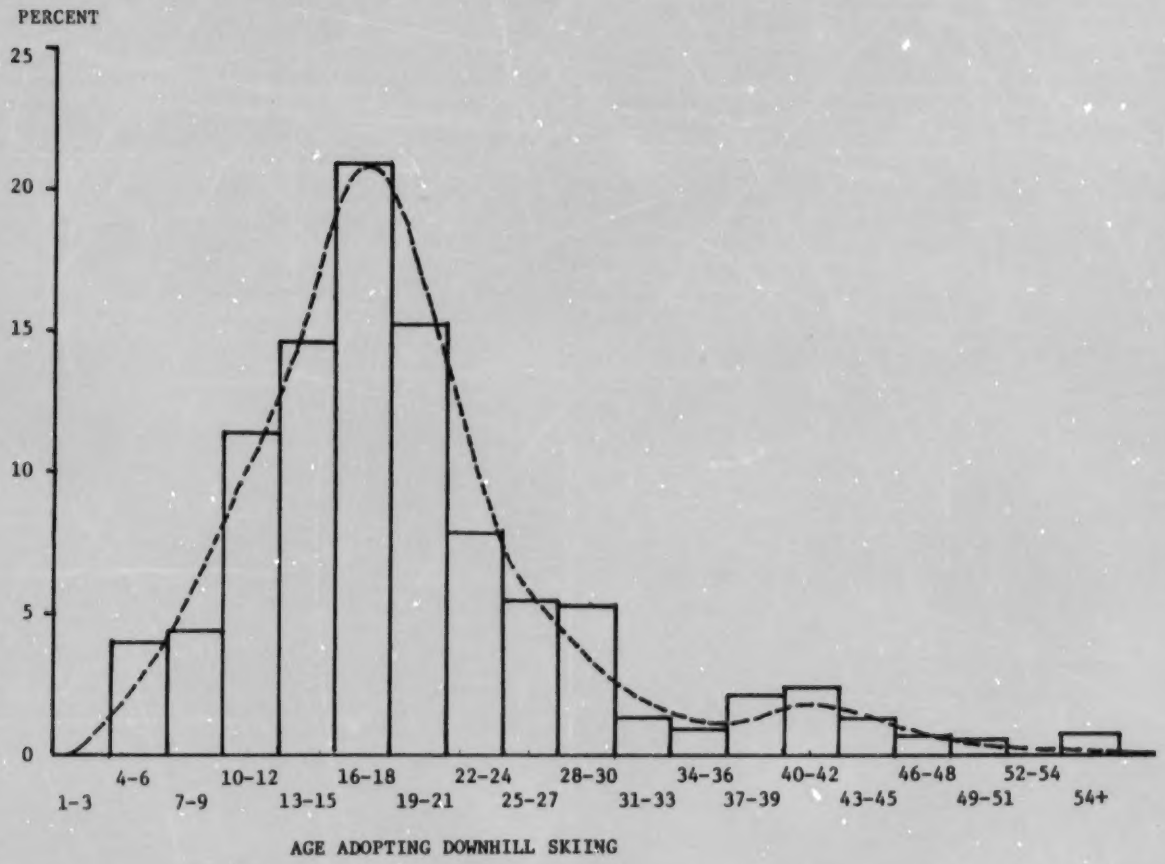


FIGURE 3. Distribution of Skiers By Age at Adoption

The first two components are directly analogous to the corresponding adoption functions, and are estimated in a similar manner. $d_1(N)$ is an exogenously determined variable permitting the user to adjust dropout rates over time. $d_2(I)$ are age-specific dropout rates assumed to be independent of N and estimated for the base year 1970. Figure 4 gives the distribution by age dropped for all inactive and dropout skiers surveyed in the 1978 Michigan ski market survey. Figure 2 plots recommended values for $d_1(N)$. These estimates should be used cautiously as they are based upon limited data.

No data exists to estimate $d_3(J)$, the relationship between dropout rates and length of involvement in skiing. An inverse square root function is assumed.

Readoption Rates

There is little data on which to base estimates of readoption. Age-specific readoption rates are based primarily upon the author's judgment and some simple experiments with the simulation model. It was assumed that readoption rates would roughly parallel adoption rates.

VALIDATION AND TESTING

Since model refinement and testing are still in progress we shall only briefly discuss validation here. It will suffice to indicate the general behavior of the model and illustrate the various model outputs. Shechter and Lucas (1978) provide a good discussion and summary of alternative methods for validating simulation models. Forecasting models offer an additional difficulty in that the "true" results are unknown.

The model's behavior is illustrated by first simulating from the year 1950 to the present and then examining forecasts to the year 2000 under alternative assumptions about the future.

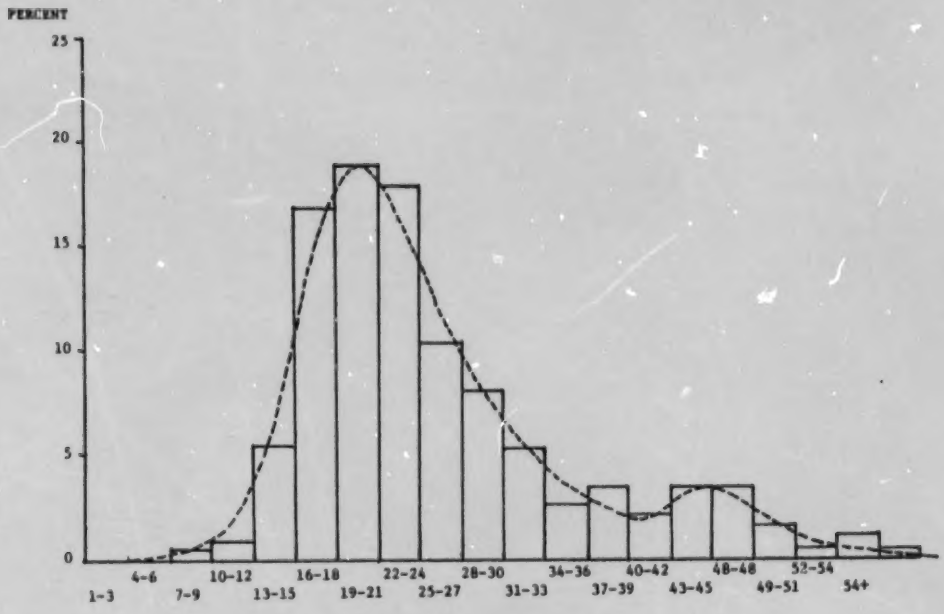


Figure 4. Distribution of Inactive Skiers by Age when Last Skied

Simulating from 1950 to 1978

The year 1950 was selected as an initial year for downhill skiing in Michigan.[4] The model was initialized using 1950 Census data for non-skiers and begun with no active or inactive skiers. A 28 year simulation period was set. Selected model outputs over this 28 year period are summarized in Tables 1-3 and Figure 5.

Simulation model results were compared with empirical data from Leuschner (1970), Stynes and Mahoney (1980), and other relevant studies of Michigan skiers. The comparisons indicate that the model predicts quite accurately both the numbers of skiers and their distribution by age and length of involvement. Leuschner estimates about 128,500 skiers in 1968 (compared with model prediction of 140,700). Leuschner included only skiers 13 years of age and older while the model keeps track of skiers 7 years and older. By 1975 active skier numbers reach 263,000. Estimating about 9 days of skiing per skier that year, this compares favorably with Domoy's (1977) estimate of 2.2 million lift tickets sold in Michigan (skier days). Growth rates of about 10% in the early 1970's drop to about 4% by 1978, resulting in just over 300,000 skiers in 1978.

Distributions of skiers by age and length of involvement compare favorably with the 1978 Michigan survey after corrections for population differences. (The Michigan survey only interviewed skiers 18 years of age and older). The 1978 Michigan skier market survey estimated that 35% of former skiers had skied only one year prior to quitting (compared with 37% predicted by the model). Also the ratio of active skiers to inactives in 1978 is almost exactly 1:2, precisely the ratio measured in the 1978 survey.

In summary, the model predicts skier numbers and characteristics for the year 1978 quite well. Of course some of this same data was used in estimating model parameters so that these comparisons do not provide a true test of the model. This will require future measurements of Michigan's skier population in order to test the model's predictive abilities.

[4] We know both ski resorts and skiers existed prior to 1950, but it is assumed that the numbers of skiers in 1950 were small enough compared with growth over the next decade to have little effect on model outputs by 1968.

Table 1. Downhill Ski Simulation 1951-1978

Numbers of Skiers (Thousands)

Year	Active Skiers	Inactive Skiers	Adopters	Dropouts	Readopters
1951	6	0	6	0	0
1952	9	3	7	3	0
1953	12	8	8	5	1
1954	16	13	8	6	1
1955	20	20	10	8	1
1956	24	26	11	9	2
1957	29	34	13	11	3
1958	35	43	14	13	4
1959	41	53	16	15	5
1960	48	64	18	18	7
1961	56	77	20	21	8
1962	65	92	23	24	9
1963	75	108	26	27	11
1964	87	126	29	31	13
1965	99	146	32	36	15
1966	111	169	34	40	18
1967	125	193	38	45	20
1968	140	220	42	50	23
1969	157	249	46	56	26
1970	175	282	50	62	30
1971	194	317	54	69	33
1972	213	356	57	76	37
1973	232	397	59	83	42
1974	248	439	58	89	46
1975	263	482	57	93	51
1976	277	524	56	97	55
1977	290	566	54	101	59
1978	301	606	51	103	63

Table 2. Downhill Ski Simulation 1951-1978

Distribution of Active Skiers

Year	AGE					YRS EXPERIENCE		
	7-12	13-18	19-24	25-30	31+	1	2	9+
	percent					percent		
1951	16	25	27	16	14	100	0	0
1952	16	25	26	16	14	74	25	0
1953	16	25	26	16	14	62	26	0
1954	16	25	26	16	14	54	26	0
1955	16	26	26	16	14	49	25	0
1956	15	26	27	16	14	45	25	0
1957	15	26	27	16	14	44	23	0
1958	15	26	27	16	14	41	23	0
1959	14	26	27	16	14	39	23	1
1960	14	27	27	16	14	38	22	1
1961	13	26	27	17	14	36	21	1
1962	13	25	27	17	15	35	21	2
1963	13	26	27	17	15	34	21	3
1964	13	26	27	17	15	33	20	3
1965	12	26	28	17	15	32	20	4
1966	11	25	28	18	15	31	20	5
1967	11	25	28	19	16	30	19	5
1968	10	25	28	19	16	30	19	6
1969	10	25	28	19	16	29	19	7
1970	9	24	29	19	16	28	19	7
1971	8	24	29	20	17	28	18	8
1972	8	23	29	21	17	26	18	9
1973	7	22	29	21	18	25	18	9
1974	7	21	30	21	19	23	18	10
1975	6	20	30	23	20	22	17	11
1976	6	18	29	24	21	20	17	12
1977	5	17	29	24	22	18	16	13
1978	5	15	28	25	24	17	15	15

Table 3. Downhill Ski Simulation 1951-1978

Distribution of Inactive Skiers

Year	AGE					YRS EXPERIENCE		
	7-12	13-18	19-24	25-30	31+	1	2	9+
	percent					percent		
1951	0	0	0	0	0	0	0	0
1952	11	21	30	17	19	100	0	0
1953	10	20	30	18	20	87	12	0
1954	9	19	30	18	22	79	16	0
1955	8	19	29	19	23	74	18	0
1956	7	18	29	19	24	69	20	0
1957	7	18	29	19	26	65	20	0
1958	6	17	28	19	27	63	20	0
1959	6	17	27	20	28	60	21	0
1960	5	17	27	20	28	58	21	0
1961	5	16	27	20	29	56	21	0
1962	5	16	27	21	30	55	21	0
1963	5	16	26	21	30	53	21	1
1964	5	16	26	20	31	52	21	1
1965	4	15	26	20	31	51	21	1
1966	4	15	26	20	32	50	21	1
1967	4	15	26	21	33	49	21	1
1968	4	15	25	21	33	48	20	2
1969	3	14	26	21	34	47	20	2
1970	3	14	26	20	34	46	20	2
1971	3	13	25	21	35	45	20	3
1972	2	13	25	22	36	44	20	3
1973	2	12	25	22	37	43	20	3
1974	2	11	25	22	37	42	20	4
1975	2	11	25	22	38	41	20	4
1976	2	10	24	23	39	40	20	5
1977	1	9	23	23	41	38	20	5
1978	1	8	22	23	43	37	19	6

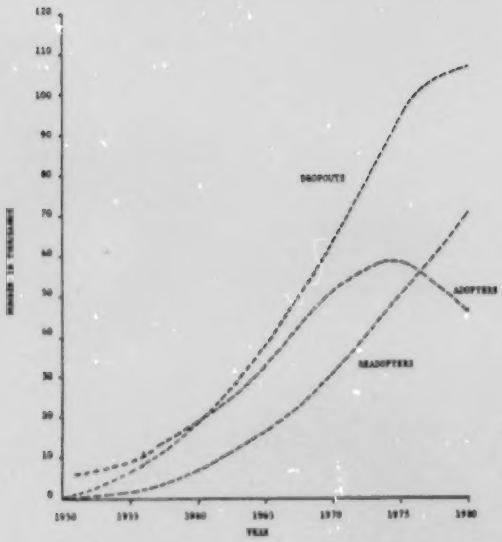


Figure 5. Growth in Downhill Ski Adoption, Dropout and Readoption 1950-1980.

However, the model's ability to begin in 1950 with no skiers and simulate 28 years ahead to accurately describe Michigan's 1978 active and inactive skier populations is very encouraging.

Formal comparisons of model outputs with empirical data bases raises a number of questions. First of all, the model produces a much greater volume of quite specific information than can be found in any empirical study. The model can predict, for example, the numbe of active or inactive skiers in 1962 who are 10 years old and have been skiing two years. No one would ever attempt to estimate this figure empirically. Secondly, empirical data generally does not precisely correspond with the model's outputs and survey data is subject to perhaps quite significant measurement errors. Differences in populations (age restrictions in surveys, for example), recall errors, and the manner in which surveys define "active" skiers are just a few of the problems that arise. Thus, in comparing model outputs with empirical data one cannot confidently assume that the empirical figure is the "true" measure. Rowan (1980) has noted the inconsistency in estimates of numbers of skiers nationally. In examining data on Michigan skiers, we uncovered similar inconsistencies.

Forecasting Experiments

Although additional model experimentation, refinement, and testing are required before the model can be used in policy analysis, we can illustrate the model's potential contribution by means of four simple experiments. In each case the model is initialized for the year 1978 and forecasts are generated through the year 2000 under alternative assumptions. The scenarios were selected to illustrate a range of possibilities.

Forecast #1 takes an optimistic view assuming that growth rates observed in 1970 will continue to the year 2000. Even under this optimistic scenario the numbers of skiers peak at 414,000 by the year 2000. The curve exhibits and S-shaped (logistic) pattern characteristic of the product life cycle (Kotler 1976). The eventual decline is in part due to an aging population structure, and also a result of market saturation. This scenario yields an active skier population in the year 2000 that is significantly older and more experienced than today's skiers.

Forecast #2 assumes a reduction in both dropout and adoption rates. This would characterize a sport with more limited entry, but with existing skiers remaining active a little longer. Skiers reach a peak in 1990 of about 373,000 and then decline to about 350,000 by the year 2000. The pattern is similar to scenario #1, but peaks a decade earlier and at a lower level.

Forecast #3 assumes a decline in adoption rates and an increase in dropout rates. It reflects a general diminishing in popularity of the sport. Under these assumptions numbers of active skiers fall to 265,000, receive a small boost from the second "baby boom," and then drop to 240,000 by the year 2000.

Forecast #4, the most pessimistic scenario, assumes that adoption rates fall to one-fifth of their 1970 values and dropout rates increase by 25%. Skier numbers drop off immediately and rapidly to less than 200,000 by 1990 and to 139,000 by the year 2000. The scenario illustrates that even under quite radical assumptions, the downhill ski market has a certain degree of inertia that will provide a degree of stability. (Figure 6)

These scenarios have illustrated only the simplest of forecasting experiments. The user may also adjust readoption rates or age-specific adoption and dropout rates to simulate skier numbers under more complex assumptions about the future. For example, a promotional campaign aimed at returning inactive skiers, or attracting skiers from older age groups could be simulated by adjusting the relevant age-specific readoption or adoption rates for years after 1980.

Experiments can also examine more datiled characteristics of future downhill ski populations. Under most scenarios future skier populations are more experienced and older than

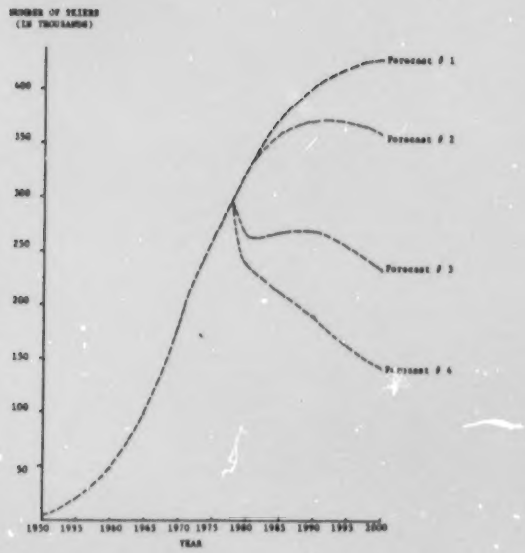


Figure 6. Downhill Ski Forecasts to the Year 2000.

today's downhill skiers. This suggests changes in marketing and ski area offerings. One may test the effects of alternative population scenarios. In one experiment the population and age structure were fixed at 1950 levels and skier numbers were simulated to 1978. This resulted in 100,000 fewer skiers than under observed population growth, indicating that approximately half of the growth in numbers of skiers since the mid-sixties can be attributed to population changes. The remainder is due to expansion in supply of skiing opportunities and increased popularity of the sport.

FUTURE MODEL DEVELOPMENT AND TESTING

Although the simulation model is operational, more testing is needed before the model can be used directly in policy analysis. Sensitivity analyses should be conducted on model parameters in order to better understand the effects of small changes in parameters on model results. This will also pinpoint key data needs of the model and guide future data collection efforts. Improved time series data on skier visits and numbers should be collected in a consistent manner in order to evaluate the predictive ability of the model and to revise and update parameter estimates. Model testing should be conducted with ski area personnel, who have a more intimate knowledge of the industry.

As with most simulation models, the number and variety of possible refinements is virtually endless. We have interrupted model testing and development in order to summarize our progress to date. There are four additions to the model that we recommend:

(1) Adding a weather variable to account for good and bad snow years

(2) Adding growth in potential substitutes like cross country skiing

(3) Predicting skier days in additon to numbers of skiers

(4) Development of a regional model

The development of a regional model is the most complex and costly and also of the greatest potential benefit. This would involve dividing the state into regions, expanding the population model to a regional one, estimating demand and supply of skiing in each region, and then predicting origin-destination patterns using a trip distribution model.

The regional model would require more data on skier trip patterns and population change within each region. Such a model could provide forecasts of more use to individual ski areas and assist in making regional development and promotion decisions.

GENERAL MODEL EVALUATION AND CONCLUSIONS

Although the model is still in a testing phase, a number of advantages over alternative forecasting approaches are already evident. Not to be overlooked is the knowledge and insight gained in the model development process itself. Raser, Campbell, and Chadwick (1970) cite five ways that simulation modeling contributes to theory development:

(1) Confrontation - modelers must confront what they do not know

(2) Explication - simulation modeling forces precise specification of relationships and assumptions

(3) Expansion - it forces a broadened, more comprehensive view

(4) Involvement - it stimulates the researcher to fill in gaps

(5) Serendipity - simulations reveal new problems, new solutions and new hypotheses

Our experience with this model confirms these advantages of computer simulation models.

The model provided a framework for evaluating the comparability and consistency of past empirical studies of downhill skiing. Many ambiguities and inconsistencies in reported market studies and forecasts were identified. Efforts to estimate model parameters and validate the model uncovered a number of gaps in existing data bases. Concentration upon active skiers in market surveys has resulted in a limited understanding of inactivity and downhill ski entry and exit decisions.

How do dropout rates change with length of involvement? Under what circumstances and at what ages do individuals tend to adopt or drop the sport? Is Michigan a net importer or exporter of downhill skiers? What are the short and long term impacts of a poor snow year on the sport? What effects will growth in cross country skiing and changing energy conditions have on downhill skiing's future? These and other questions arose during stages of model development, parameter estimation, validation, and refinement. Answers to these types of questions from future research can be directly translated into improvements and refinements of the simulation model. The simulation model therefore plays a much stronger role in the research process than one generally finds with more traditional types of models.

In concluding we discuss what we view as the five most important features of the model and then briefly address model limitations.

(1) The model is dynamic. It not only can predict change over time, but its basic structure captures the processes of entry and exit within the ski market. Timelags, feedback effects, and other dynamic features of the model can be explored to better understand change in recreation activity markets. In particular, the model illustrates a number of general growth concepts and theories including the product life cycle, diffusion theories, market saturation, and consumer involvement cycles. These processes may be generalized to other activities.

(2) The model is both simple and logical. Adoption, dropout, and readoption of activities are easily understood processes. Complexity is introduced in the model primarily in the estimation of critical model parameters. This permits a separation of the more technical aspects of the model from the more easily understood, making the model easy to use and understand for practitioners, while permitting researchers to explore more detailed and complex features of the model and the system being modeled.

(3) The model is completely general. It could be applied to virtually any activity or product in any state or region. One must simply add a population model for the region in question and estimate adoption, dropout, and readoption rates over time. The generality of the model facilitates the transfer of findings about recreation activity dynamics across regions and activities.

(4) The model is extremely flexible. It can generate an infinite array of outputs in a variety of forms. Components may be easily added to the model. Thus, it provides a framework for both guiding and integrating future research on recreation participation decisions.

(5) Finally, the model may be used in a variety of settings. Researchers will find it useful in suggesting hypotheses and in exploring dynamic aspects of the ski market. The model can also help in directing future data collection efforts by identifying gaps or inconsistencies in current data and suggesting the relative importance of precision in the measurement of different variables. For ski area personnel and students, the model may be used in a gaming format to explore futures and to test the relative effects of alternative promotional and development strategies. The effects of population change can be dramatically illustrated with the model.

Since the model in its current state is a statewide aggregated model, it cannot be tied directly to individual ski area decisions. It can however contribute to broader statewide and industrywide policy and promotion decisions. While the model could be disaggregated into a regional model including ski travel behavior, this refinement would require considerably more modeling and data collection.

Limitations of the model relate primarily to the lack of data that are ideally suited for parameter estimation or validation. The model requires estimates of adoption, dropout, and readoption rates over time. Future research should develop models to predict these rates based upon social, economic, and environmental variables. Such relationships could then be added to the existing model to internalize relationships that must presently be estimated outside the model.

Development of the model cost about $5000. A similar amount was required for the 1978 Michigan ski market survey, which in addition to gathering data to estimate model parameters, also produced two ski marketing reports (Stynes, Mahoney and Spotts 1980, Stynes and Mahoney 1980). A typical forecast to the year 2000 costs less than a dollar in computer costs and generates a wealth of data. Computer simulation models do not have to be expensive.

LITERATURE CITED

Cesario, Frank J. 1975. A Simulation Approach to Outdoor Recreation Planning. J. of Leisure Research 7(1):38-52.

Cicchetti, C.J. 1973. Forecasting Recreation in the United States. D.C. Heath. Lexington, Mass.

Domoy, Francis. M. 1977. An Employment Analysis of the Michigan Ski Industry. Michigan State University Agricultural Experiment Station Research Report No. 329. East Lansing.

Ellis, J. and C. VanDoren. 1967. A Comparative Evaluation of Gravity and Systems Theory Models for Statewide Recreation Flows. J. of Regional Science 6:57-70.

Farwell, Ted and Associates. 1977. Skiing Demand and Supply Study for the Lower Peninsula of the State of Michigan. Report prepared for the U.S. Forest Service, Huron-Manistee National Forest, Cadillac, Michigan.

Hamilton, H.R. et al. 1969. Systems Simulation for Regional Analysis: An Application to River Basin Planning. Cambridge, Mass.: MIT Press.

Ladany, Shaul F. (ed). 1975. Management Science Applications to Leisure Time Operations. American Elsevier. New York.

LaPage, Wilbur F. 1978. Growth Potential of the Skier Market. Review Draft. USDA Forest Service, Northeastern Forest Experiment Station. Broomall, PA.

Leuschner, William A. 1970. Skiing in the Great Lakes States: The Industry and the Skier. USDA Forest Service Research Paper NC-46. North Central Forest Experiment Station. St. Paul, Mn.

Meadows, Donella H., Dennis L. Meadows, Jorgen Randers, and William W. Behrens III. 1972. The Limits to Growth. Potomac Associates. New York.

Moeller, George H. and Herbert E. Echelberger. 1974. Approaches to Forecasting Recreation Consumption. Outdoor Recreation Research: Applying the Results. U.S. Forest Service General Technical Report NC-9. St. Paul, Mn.

Moeller, George H., Elwood L. Shafer, and Russell Getty. 1977. Leisure Environments of Tomorrow. Outdoor Recreation: Advances in Application of Economics. US Forest Service General Technical Report WO-2. New Orleans, La.

Pittenger, Donald B. 1976. Projecting State and Local Populations. Ballinger: Cambridge, MA.

Raser, John R., Donald T. Campbell and Richard W. Chadwick. 1970. Gaming and Simulation for Developing Theory Relevant to International Relations. General Systems 15:183-203.

Rowan, David. 1979. The Great Numbers Game. Ski Area Management. 18(3):14-18.

Shechter, Mordechai and Robert C. Lucas. 1978. Simulation of Recreational Use for Park and Wilderness Management. John Hopkins, Baltimore.

Shryock, Henry S., Jacob S. Siegal, and Associates. 1971. The Methods and Materials of Demography. Volume 2. US Department of Commerce, Bureau of the Census. Washington, D.C.

Smith, V. Kerry and John V. Krutilla. 1976. Structure and Properties of a Wilderness Travel Simulator. John Hopkins, Baltimore.

Stynes, Daniel J. 1979. A Simulation Approach to the Determination of Recreation Carrying Capacity. Proceedings National Workshop on Computers in Recreation and Parks. August 1-3, 1979. St. Louis, Missouri. National Recreation and Park Association.

Stynes, Daniel J., Edward M. Mahoney and Daniel M. Spotts. 1980. Michigan Downhill Ski Marketing Study: A Comparison of Active, Inactive, Dropout and Potential Skier Market Segments. Michigan State University Agricultural Experiment Station Research Report 389.

Stynes, Daniel J., and Edward M. Mahoney. 1980. Michigan Downhill Ski Marketing Study: Segmenting Active Skiers. Michigan State University Agricultural Experiment Station Research Report No. 391. East Lansing.

Stynes, Daniel J., and Kevin Szcodronski. 1980. Predicting Trends in Michigan Snowmobile Populations Using Product Life Cycle and Diffusion of Innovations Theories. Proceedings of the First North American Symposium on Dispersed Winter Recreation. University of Minnesota, St. Paul. (to appear May 1980).

Stynes, D.J., M.I. Bevins, and T.L. Brown. 1980. Trends or Methodological Differences? Proceedings 1980 National Outdoor Recreation Trends Symposium. Northeastern Forest Experiment Station. Broomall, PA.

West, Patrick C. 1977. A Status Group Dynamics Approach to Predicting Participation Rates in Regional Recreation Demand Studies. Land Economics 53(2):196-211.

"THE DYNAMICS OF RECREATION PARTICIPATION: SKI TOURING IN MINNESOTA"

Timothy B. Knopp, Associate Professor
University of Minnesota
College of Forestry
Department of Forest Resources
110 Green Hall
1530 North Cleveland Avenue
St. Paul, MN

G. Ballman
University of Minnesota
College of Forestry
Department of Forest Resources
110 Green Hall
1530 North Cleveland Avenue
St. Paul, MN

L. C. Merriam
University of Minnesota
College of Forestry
Department of Forest Resources
110 Green Hall
1530 North Cleveland Avenue
St. Paul, MN

ABSTRACT:

A realistic model or framework for the analysis of recreation behavior must be both comprehensive and dynamic. Most attempts to explain recreation behavior are static in that they do not allow for changes in the character of an activity or the evolution of a participant's involvement. Even predictive models tend to assume that relationships remain constant over time. A dynamic model is especially critical in the analysis of new, rapidly evolving forms of recreation.

The recent, rapid growth of ski touring in Minnesota provides an ideal opportunity to document and analyze the dynamics of participation. The parallel growth of snowmobiling is a basis for comparison and the chance to examine the effect of alternative forms of recreation on participation.

Questionnaire responses from a random sample of Minnesota ski tourers (1978) provided data used to examine two important aspects of internal dynamics. First, as the dominant image of ski touring changes we can expect a corresponding change in the motivations of persons taking up the activity. Second, as skiers increase in skill and experience they will seek more challenging situations and a greater variety of opportunities. These hypotheses were tested by comparing recent adherents to more experienced skiers.

Newer adherents were more likely to be female and less likely to be college graduates. Comparisons of age and residency were inconclusive. Participation in other forms of winter recreation relate to ski touring in a variety of ways. A growing percentage of those taking up ski touring have participated in snowmobiling. The pursuit of exercise and the outdoor environment have consistently been primary reasons for taking up the sport. The influence of friends appears to be an increasing factor. While self-rated skill level is directly correlated with years of experience, there is only a slight tendency for new skiers to prefer well groomed and marked trails, and a tendency to label longer trails and remote areas undesirable.

INTRODUCTION

A good deal of research effort has been directed toward predicting trends in the rate of participation in various recreational activities. To a large extent these have relied on extrapolations or empirically derived correlations between participation rates and the socio-economic characteristics of a population. We are now beginning to take the next step, i.e., the identification of mechanisms which explain changes.

Several individuals, including Christy (1970) and Meyersohn (1957), have described what they feel are the important determinants of "mass" recreation or "fads". More recently West (1977) developed an innovative "status group dynamic approach to predicting participation rates". While the latter goes a long way toward explaining and quantifying change, it relies heavily on the validity of the status concept and the symbolic function of recreation activities.

Motivational research has contributed a great deal to our understanding of why people participate in various activities. In particular the recent models and scales developed by Driver and Brown (Driver 1977); (Driver and Brown 1975) have brought this approach to a high level of sophistication. Tinsley (1977; 1978) has also contibuted a great deal to an understanding of motivations and need satisfaction. However, many of the concepts in motivational research are somewhat static in that they seldom allow for changes within the individual or in the character of the activity.

There is an obvious need for a comprehensive, dynamic framework which identifies factors and relationships effecting changes in recreation participation. We can begin by making unstructured, but detailed, observations of specific activities over time. Once a skeleton framework has been developed we can fill it in with statistical analyses of the linkages and mechanisms operating within the framework.

The recent, rapid growth in the popularity of ski touring in Minnesota provides an excellent opportunity for the approach outlined above. Although ancient in origin, the activity is relatively new in terms of mass participation in the United States. Some indication of the significance of this development can be ascertained by comparing the 1977-78 season Minnesota Department of Natural Resources (MDNR) estimate of 500,000 participants based on a statewide, random survey, with the few hundred to a thousand ski tourers present in 1965. Current figures show an annual growth rate of from 20 to 30 percent (Ballman, 1979).

We will begin by describing the various mechanisms believed to be operating in the evolution of ski touring in Minnesota. Many of these mechanisms can be abstracted in the sense that they probably operate to a greater or lesser extent in the history of any recreational activity. As far as is possible these mechanisms will be systematically linked within a comprehensive framework.

Next we will utilize recent data from a statewide survey of ski touring participants in Minnesota to test some of the mechanisms suggested in the first part. No data set can completely encompass the complexities of recreation participation. It is critical that any statistical analysis be proceeded by the development of a comprehensive framework so that the data can be kept in perspective and we can avoid the temptation to adopt narrow, self-contained explanations of behavior.

A FRAMEWORK FOR ANALYSIS

This framework is derived from unstructured and structured observation, the contributions of previous research, and an intuitive notion of recreation behavior. The framework consists of the various mechanisms which can influence recreation participation and the patterns of change over time. The growth and evolution of ski touring in Minnesota will be used to illustrate the framework. In this initial discussion no attempt will be made to quantify the effect of any specific factor, this will be left to an analysis of survey data. Some difficulties will be encountered where the same factor can influence different persons in dramatically opposite ways.

Defining Participation

Before we can begin to describe the factors influencing participation we must deal with the meaning of the term participation. Participation has both quality and quantity dimensions. The latter can be expressed in terms of numbers of individuals, man-hours, visitor days, or miles skied. These measures must be defined still further to be operationalized. If we are concerned with numbers it is necessary to list the criteria for inclusion; e.g., who do we consider a ski tourer? Anyone who has ever skied, or those who have skied a minimum number of miles in the past season. For some purposes "dollars invested" may be an appropriate criteria.

Man-hours also requries a more explicit definition. Do we include travel or resort time, or only the hours on the trail? A visitor day has been standardized by the U.S. Forest Service and the National Park Service as an expression of occupancy. Although "visitor day" is a practical measure for making some crude comparisons, it is generally insensitive to subtle changes in the character of participation.

The quality dimension pertains to both the nature of the activity and the environment in which it takes place. Racing is a far differenet experience than casual touring or winter camping--all of which can take place in the same area. An urban park and a remote wilderness each provide a distinctly

different experience even where the physical motions are the same.

We will not elaborate further on a definition of participation. The importance of explicit definitions will become more obvious as the discussion proceeds. Suffice it to say that any definition must be appropriate for the change or comparison which is being described and the purpose to which the analysis will be applied.

Inherent Appeal

Any analysis of participation dynamics must begin with a thorough familiarity with the inherent appeal of the activity(s) in question. There are three primary characteristics to consider: novelty, variation, and efficiency. Novelty is a function of "newness" or contrast with other pastimes. Our example, ski touring, has characteristics in common with a number of other forms of recreation. It can provide some of the thrills of downhill skiing; it allows access to many of the same environments as does snowmobiling; it can offer health benefits similar to running. In part the "uniqueness" of ski touring probably lies in the combination of benefits it can furnish.

But, in addition, ski touring has some subtle attributes which are revealed only by a more intimate acquaintance with the activity. Ski touring is a form of exercise that can be performed with "grace" and "dignity". By comparison, jogging is often associated with smelly sweat clothes and an ungainly shuffle. Another alternative, the bicycle, still has connotations of a child's toy for many adults. Ski touring provides the means to ease gently into an exercise routine; the transition from a leisurely stroll to a strenuous workout is gradual and without the distinct change of gait which separates walking from running. These, and other characteristics which are not obvious to a casual observer, may be important determinants of the activity's appeal.

Variation refers to the range of experiences possible within the scope of an activity. Ski touring can vary from a leisurely stroll to strenuous competitive racing. Access to different environments also contributes to variation. Ski touring, because it is relatively unobtrusive, is tolerated in residential areas and fragile wilderness areas. A ski tourer can choose between solitude and the mayhem of a mass start tour-race. Complementary facilities also add to variety. Lodging may consist of a hole in a snow drift or a luxury resort.

Efficiency is simply the net result of a tally of costs and benefits. Costs may include monetary investment, time, energy, inconvenience, negative image or stigma, and possible loss of social relationships. Variation contributes the most to the benefit side of the ledger. The value of a specific benefit, however, will depend on individual and collective needs.

Inherent appeal is most easily comprehended relative to alternative forms of recreation. All in all, ski touring probably rates quite high compared to the major winter outdoor alternatives currently available.

Sources of New Participants and Dropouts

Participation in ski touring is often thought of in terms of the number of individuals who have skied during the current season. Generally, numbers fluctuate for one of two reasons: 1) individuals enter or leave segments of the population with varying rates of participation, or 2) individuals are attracted to or repelled by the activity due to changes, real or perceived, in its character.

The character of an activity is the product of opportunities (facilities and natural conditions), the commercial impetus and the behavior of those participating.

The first mechanism can be understood fairly easily by examining the correlation of participation with traditional socio-economic cohorts. For example, certain individuals will begin to participate at a minimum age and drop out when they consider themselves to old. Position in the family or career cycle also affects participation in somewhat predictable ways. Although these mechanisms are always operating, they can be used to explain or predict change only when an activity has stabilized in respect to the kinds of opportunities available and the image it presents; this is definitely not the case with ski touring during its recent evolution.

Ski touring began as a relatively obscure form of recreation often confused with downhill skiing. It was, and to some extent still is, perceived as the blind men described an elephant. Some thought it was cross-country racing; others viewed it as bushwacking through remote, untracked wilderness. Few people understood the full range of opportunities the activity could provide.

At the same time real changes were occurring. The sport grew more visible--via word of mouth, popularized articles and deliberate promotions on the part of organizations such as the United States Ski Association and local ski touring clubs. Later the

commercial establishment joined the efforts to promote ski touring. While all segments of the population are affected by the increase in visibility, we cannot expect the effect to be equal in magnitude across the population. The better informed individuals are the first to become aware of any new opportunity. As an activity becomes generally well known other segments of the population may account for an increasing portion of new participants.

Opportunities in the form of areas and physical facilities have also changed. Marked and groomed trails became more plentiful. Beginning in the early 1970's "citizens' tour races" were organized and promoted. Increases in trails and areas did not keep pace with growing numbers; consequently skiers confronted crowds which weren't experienced by their predecessors. The image of ski touring as a social event became more pronounced.

Ski touring equipment has also evolved. Tough, easily maintained fiber-glass skis became gnerally available in the mid to late 1970's. Waxless skis appealed to the casual participant. Lightweight poles and bindings added to the array of choices. For some the refinements in equipment make the activity easier; for others the equipment itself may be an attraction.

All of these changes meant that ski touring was not the same activity it was during the earlier stages of its development. Some would find the activity more appealing because large numbers of participants had demonstrated that it is "acceptable" and beneficial. The enthusiasm of others may have waned because it is no longer as exclusive and uncrowded trails are more difficult to find. The net effect has obviously been positive. In spite of any dominant image, the full range of experiences is still available.

External Factors

Recreation behavior does not exist in a vacuum. Independent changes occurring in society can act to discourage or encourage participation. These include economic trends, value sets, the environmental setting and alternative forms of recreation.

An affluent society can afford more expensive playthings; conversely, hard times may stimulate interest in less costly activities. Ski touring requires a smaller monetary investment than some of the competing outdoor winter recreation activities and therefore may be relatively favored by a general reduction in per capita buying power. Participants often cite low cost as a motivating factor. It is interesting to note that ski touring experienced an earlier resurgence during the depression years.

Value trends affect the image associated with a form of recreation. To the extent that people are really concerned about the environment, the energy crisis and the consumption of resources they may adopt forms of recreation which they perceive as consistent with their beliefs. The choice of recreation may be in part a genuine effort, and in part a symbolic gesture. Ski touring is considered to have a relatively low impact on the environment and a beneficial effect on health; thus the magnitude of these trends can be expected to influence participation.

Ski touring may also be considered consistent with current efforts on the part of some to become independent of complex, interdependent socio-economic systems. Some feel less vulnerable if their recreation does not depend on foreign oil and highly technical machines.

There is considerable evidence that the environmental setting of the home and workplace has an influence on the selection of a recreational activity (Knopp, 1972). Deficiences in these settings might be expected to create needs; compensation may be sought in the recreation experience. It is difficult to document this influence because it is almost impossible to control for visibility and means which may mask its effect.

The growth in ski touring may be associated with a growth in confinement and restraints imposed by urbanization and winter itself. Ski touring provides access to a vast resource of open space, nature, and freedom.

Alternative forms of recreation may complement and reinforce participation, or they may compete for time and other resources. The latter can occur in two ways: first, a direct competition for participants; and second, they can preempt space and resources, thus reducing opportunities. No discussion of ski touring would be complete without reference to the parallel growth in snowmobiling.

In a practical sense, snowmobiling made its appearance a few years before ski touring (major growth took place in the late 1960's). For this reason the activity gained a large number of adherents who may have chosen ski touring if that alternative had been equally visible. Furthermore, large areas of land and financial resources were allocated to snowmobiling, thus affecting the opportunities

for ski touring experiences. Another possible relationship is that the confidence and skills learned from snowmobiling provided a pool of winter acclimated persons who could easily transfer into ski touring. The extent of these effects may be impossible to measure, but the example does serve to illustrate the importance of timing and the sequence of exposure to alternative forms of recreation.

Other forms of recreation have had a less dramatic relationship. Downhill skiing also competes for participants and their time; at the same time it also furnishes new adherents who convert entirely or partially to ski touring because of cost, crowded lift lines or threat of physical injury. The popularity of running contributes to a population which is physically better able to enjoy ski touring and is likely to seek a winter supplement to their training program. On the other hand, heavily committed runners may be reluctant to devote any effort to an activity which doesn't directly benefit their running ability.

We have discussed only a few of the most obviously related alternatives. Every other form of recreation will have some effect on participation. To cite one more example. Television may be considered a direct competitor--and yet, some have argued that coverage of the winter olympics stimulated many to take up ski touring.

Internal Dynamics

So far we have focused on factors which determine whether an individual participates in a given form of recreation. Profound changes also occur after an individual joins the ranks of participants. Some of these changes occur independently of participation and were included in our reference to sources of new participants and dropouts resulting from transfer from one socio-economic segment of the population to another. Here we will point out changes brought about by participation itself.

One change is an increase in skill, knowledge and confidence. Ski tourers, for example, might be expected to seek more demanding experiences or to increase the rate at which they utilize trails and areas. A closely correlated effect of increased experience may be a demand for variation, either in terms of the activity or new and different environments. Ski tourers who begin on the local golf course may end up in competitive racing or wilderness treking. Increased specialization or an intensified interest in a narrow segment of an activity is typical of the individual's involvement in any form of recreation. Changes in the behavior of those already participating can bring about significant shifts in demand.

Experience can affect some participants very differently. These individuals will become "saturated" with the opportunities provided by an activity and drop out altogether in order to seek an even more contrasting experience. A similar, but quicker, response can be expected from those who simply discover after a trial period that the activity is not to their liking. The net effect of these countervailing responses is dependent on the inherent appeal and variation within an activity.

When an individual elects to take up an activity he or she is making an investment in dollars, time, energy, and social alliances. These investments will tent to perpetuate involvement. In some instances the social benefits or obligations may become the primary motivation for continuing the activity. The same can be said, of course, for competing alternatives. Many of those who became involved in snowmobiling before they were aware of ski touring will have a difficult time switching to ski touring, even if they perceived the activity itself as more desirable.

The accumulative effect of internal changes may be more important than changes in total numbers of participants. In a rapidly evolving activity, such as ski touring, this effect is probably even more significant. It may be a mistake to predict demand on the basis of current preferences when a future ski touring population will be much more experienced and skilled.

The Role of the Commercial Sector

It is probably safe to assume that there is no perceived human need that someone won't attempt to "capture" in the economic sense. Recreational benefits vary tremendously in their susceptibility to capture. Ski touring, relative to its main rivals snowmobiling and downhill skiing, is more difficult to package. The equipment is relatively less expensive and the activity is not as restricted to specially developed facilities. For these reasons ski touring was largely ignored by the commercial sector during its early years of evolution in the United States. In fact, the downhill ski industry may have deliberately tried to subdue the public's exposure to a competing activity (Fishman, 1978).

Ski touring (running provides a similar parallel) continued to grow because of its inherent appeal. The commercial sector joined the "bandwagon" and has since devel-

oped innovative ways to package and sell the ski touring experience. The primary approach has been an effort to convince skiers that they need more refined, and often more expensive, equipment in order to fully enjoy the potentials of the sport. Gadgets also proliferate as any activity becomes popular. Appeals to the fashion conscious are prevalent. Resorts are providing groomed trails and elaborate lodging facilities. Organized tours to exotic environments are being made available.

There is little doubt that the commercial sector has added tremendously to the array of opportunities within the sport of ski touring and thus has helped to perpetuate interest in the activity. The success of these innovations is probably assured by the much broader range of persons now participating in ski touring. Whereas the early "pioneers" often prided themselves in their resourcefulness and spartan demands, the broader spectrum of recent adherents are more likely to include those seeking comfort and convenience. This is not to say that the old hands won't also take advantage of the new opportunities provided!

Rate of Change and Cycles

It is relatively easy to predict the direction of change; somewhat more difficult to predict the ultimate potential; and nearly impossible to predict the rate of change in participation in a recreation activity. Ski touring grew slowly during its initial stages because it lacked a strong commercial impetus. The flow of information was largely dependent on word of mouth, organizations, and magazine articles. Television and billboard exposure was minimal.

Inherent characteristics would indicate a potential for rapid growth once the visibility barrier was overcome. The sport requires a relatively small investment in money and time to learn special skills; therefore a person can quickly become a participant.

For simplicity's sake our discussion has implied a linear, one-way pattern of change. The same mechanisms, and others yet unidentified, may bring about short or long term cycles. For example, an individual may tire of ski touring, drop out temporarily and join again at a later time. When this mechanism affects a large number of persons at the same time we can expect larger cycles in the total number of participants. Even shorter, day to day or minute to minute, cycles are probably operating--although these are less important in a discussion of long term trends. The seasonal cycle brought about by the climatic requirements of ski touring may serve to prolong interest over the long term by forestalling saturation.

Summary of Framework

One is tempted to describe the changes in participation as "phases" in a predictable pattern of change. First, there is a pioneer phase led by a small cadre of individuals willing to explore and risk disappointment. These people may seek out, or even develop, a form of recreation which fulfills well defined needs. In Stanley Plog's (1974) terms these are the "alocentrics," while those who follow can be labeled "psychocentrics". Second, others, with similar motivations, take up the activity as it becomes more generally visible. In the third phase, followers join when there is an ample demonstration of acceptability and benefits. During the fourth phase the activity stabilizes when it is generally well known to the total population and there are few changes in the nature of the opportunities available. A fifth phase may or may not occur. This last phase is a decline in participation because of external factors or simply because the novelty of the experience wears off. Other events may disrupt a long period of stability. For example, a major breakthrough in equipment may make participation easier or more enjoyable. Stynes (1980) and others, have postulated a "product life cycle" concept which implies a predictable decline in participation. It is hazardous to impose a standard pattern on all recreation participation phenomena. Although this sort of description can help to organize our thinking, it is no substitute for an understanding of the specific mechanisms at work.

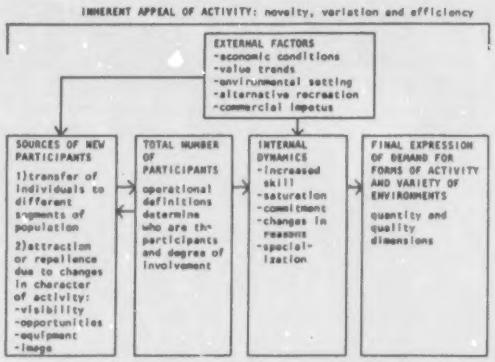


Figure 1. A schematic representation of the factors which influence the quantity and quality of participation. Short term and longer cycles may occur within the context of this framework.

Figure 1 provides a graphic summary of the mechanisms and patterns described earlier. As is true of any attempt to organize reality it is somewhat arbitrary and simplistic. It

does serve the purpose of aiding researchers in their efforts to systematically deal with the complexities of participation dynamics. Modifications and refinements can occur as our knowledge and experience increases.

The ultimate output of any analysis conducted within the context of this framework is a better estimate of the demand for experiences, both the quantity and quality dimensions.

A PARTIAL TEST OF THE FRAMEWORK

Methods

A statewide, random telephone survey of Minnesota residents conducted by the Minnesota Department of Natural Resources in 1978 provided a representative sample of state ski tourers. Anyone over 14 years of age who had "cross-country skied sometime during their life" was included in the sample. Our study utilized a four page questionnaire mailed to the sample. A 75 percent response rate produced a sample of 597 completed questionnaires. The survey instrument solicited four categories of information: 1) patterns of participation; 2) reasons or motivations for participation; 3)environmental preferences; and 4) demographic characteristics. Although the questionnaire was not designed primarily to study the dynamics of participation, one question, "In which season did you first go cross-country skiing?", enables us to examine the changes over time.

For the purposes of this report several variables were cross-tabulated with the year an individual first took up the activity. While this sort of data does not lend itself well to statistical tests it does allow us to look for patterns of change and to speculate on the mechanisms at work.

Two broad questions will be addressed: 1) Are recent adherents motivated differently than those who took up the sport early in its development? and 2) Do more experienced skiers prefer more challenging areas and/or more variation in opportunities?

Changes Over Time in the Characteristics and Motivations of New Adherents

Tables 1 through 6 show some of the characteristics of participants according to the year they first took up the sport. In examining these tables it is critical to remember that the first category contains all of those who had skied prior to the 1972-73 season. This could include some elderly individuals who had skied early in the century but very little since. Given the rapid rate of increase in participation during the past 10 to 12 years the latter probably account for a very small portion of the sample.

Table 1: Level of education and first season of cross-country skiing

First Season	YEARS OF EDUCATION, RELATIVE FREQUENCY (PERCENT) 1-8	9-12	13-16	17+	(N) %
prior to 1972-73	(2) 3	(10) 17	(25) 42	(23) 39	(60) 100
1972-73	(1) 2	(9) 22	(17) 42	(14) 34	(41) 100
1973-74	(0) 0	(17) 28	(36) 59	(8) 13	(61) 100
1974-75	(0) 0	(29) 41	(25) 35	(17) 24	(71) 100
1975-76	(1) 1	(29) 31	(41) 43	(24) 25	(95) 100
1976-77	(3) 3	(39) 40	(43) 44	(13) 13	(98) 100
1977-78	(0) 0	(51) 39	(64) 48	(17) 13	(132) 100

The most pronounced changes have ocurred in the level of education and the sex of participants (Tables 1 and 2). College graduates have become a smaller percent of new adherents while the proportion of those with some high school education has increased. This is consistent with West's notion of "status group diffussion". The change can also be accounted for by increased visibility and the role of the media.

Table 2: Sex distribution and first season of cross-country skiing

First Season	RELATIVE FREQUENCY (PERCENT) FEMALES	MALES	(N) %
prior to 1972-73	(25) 42	(35) 58	(60) 100
1972-73	(18) 45	(22) 55	(40) 100
1973-74	(28) 47	(32) 53	(60) 100
1974-75	(47) 66	(23) 34	(70) 100
1975-76	(62) 65	(33) 35	(95) 100
1976-77	(49) 50	(49) 50	(98) 100
1977-78	(86) 64	(48) 36	(134) 100

Females are increasing their involvement in many forms of recreation once considered primarily for men. Changes in the image of ski touring from a very demanding, physical type of sport to a more casual, social pastime with complementary facilities may also have contributed to the increased participation by women.

Changes in age structure (Table 3) are more difficult to interpret. There is an apparent decrease in the percentage of "older" (40-54 and 55+) skiers and an increase in the 25-39 category; although the latter accounts for a large percent of those who took up ski

touring prior to 1972. At least some of the change is an artifact of the tabulation itself, i.e., younger persons are less likely to have taken up ski touring at an earlier date.

Table 3: Age distribution of participants and first season of cross-country skiing

First Season	AGE CATEGORIES, RELATIVE FREQUENCY (PERCENT) 15-24	25-39	40-54	55+	(N) %
prior to 1972-73	(4) 7	(26) 45	(14) 24	(14) 24	(58) 100
1972-73	(17) 42	(11) 28	(10) 25	(2) 5	(40) 100
1973-74	(27) 45	(17) 28	(13) 22	(3) 5	(60) 100
1974-75	(23) 34	(31) 45	(12) 18	(2) 3	(68) 100
1975-76	(40) 43	(37) 40	(13) 14	(3) 3	(93) 100
1976-77	(39) 41	(41) 43	(12) 12	(4) 4	(96) 100
1977-78	(56) 43	(52) 40	(19) 15	(3) 2	(132) 100

Responses to the question of residency (Table 4) are also difficult to analyze. We can't be sure what an individual thought was meant by "rural area," nor can we be certain whether a suburbanite would consider himself or herself a resident of a suburb or the Twin Cities Metro Area. It is probably safest to lump both ends of the spectrum for the basis of comparison. Still, at least a few of those who think of their residence as "rural" probably live on the fringe of the metro area and have a more urban lifestyle. This interpretation may help to reconcile our data with the results a statewide Department of Natural Resources survey (1979) conducted in 1978 which provided an estimate of the number of persons who had cross-country skied during that season. Sixty-three percent of the skiers were from the seven-county metro area.

Table 4: Distribution of residency and first season of cross-country skiing

First Season	DISTRIBUTION OF RESIDENCY, RELATIVE FREQUENCY (PERCENT) over 250,000	25,000-250,000	10,000-25,000	less than 10,000	rural	(N) %
prior to 1972-73	(10) 17	(8) 13	(10) 17	(14) 24	(17) 29	(59) 100
1972-73	(5) 12	(9) 22	(8) 19+	(8) 19+	(11) 27	(41) 100
1973-74	(12) 20	(12) 20	(9) 15	(11) 18	(16) 27	(61) 100
1974-75	(11) 15	(14) 20	(17) 24	(10) 14	(19) 27	(71) 100
1975-76	(16) 17	(14) 14	(19) 20	(23) 24	(24) 25	(96) 100
1976-77	(16) 16	(23) 24	(12) 12	(21) 22	(25) 26	(97) 100
1977-78	(22) 17	(21) 16	(26) 20	(23) 17	(39) 30	(131) 100

Residency is an important factor is that it allows us to monitor the diffusion of ski touring from the urban areas (where the current resurgence has been most pronounced) to the more rural areas. The relative stability in our data may indicate that differences in visibility weren't as great as suspected. Another possibility is that snowmobiling has had a secure hold on the rural population and individuals are reluctant to give up an investment with known benefits for a (to them) new activity.

In speculating on the growth of an activity it may be valuable to know to what extent participants in similar activities are providing a reservior of potential adherents. Table 5 shows the extent to which cross-country skiers have participated in other forms of winter recreation.

Table 5: Participation in other winter activities and first season of cross-country skiing

First Season	DISTRIBUTION OF PARTICIPATION IN OTHER WINTER ACTIVITIES snow-shoeing	downhill skiing	snow-mobiling	winter camping	no other	(N) %
prior to 1972-73	(30) 50	(36) 60	(38) 63	(22) 37	(8) 13	(60)
1972-73	(20) 49	(26) 63	(25) 61	(12) 29	(2) 5	(41)
1973-74	(30) 49	(43) 70	(44) 72	(16) 26	(4) 6	(61)
1974-75	(30) 42	(46) 65	(51) 72	(14) 20	(6) 8	(71)
1975-76	(31) 33	(71) 75	(67) 70	(18) 19	(4) 4	(95)
1976-77	(34) 35	(65) 66	(73) 74	(18) 18	(7) 7	(98)
1977-78	(36) 27	(77) 58	(99) 74	(26) 20	(14) 10	(133)

Earlier participants were more likely to have engaged in snowshoeing. Changes in relative visibility may explain some of this trend, i.e., snowshoeing probably had nearly the same level of visibility during the early stages of the growth of ski touring. The trend is also consistent with the idea that earlier adherents were more likely to be "pioneers" who were exploring a number of different forms of recreation.

Downhill skiing is a natural complement to cross-country skiing. On the other hand it is common for individuals to state that they have switched to touring because of increased costs, crowding or concern for possible injuries. Our data is inconclusive in that it is also possible for a person to begin as a cross-country skier and switch to downhill as they gain confidence and seek a wider range of experiences.

There has been a great deal of speculation about the relationship between snowmobiling and cross-country skiing. Our data show a slight increase in the number of new skiers who have participated in snowmobiling. We can expect that as the number of ski tourers increase it will draw upon a large existing population of snowmobilers. The gradual decline in snowmobiling since 1976 (as indicated by the registration of machines)

reinforces the probability that some snowmobilers are turning to ski touring as an alternative form of winter recreation; it also tends to reduce the probability of an alternative explanation, i.e., that a greater percentage of new skiers are taking up snowmobiling simultaneously.

Winter camping is more complementary than competitive in its relation to ski touring and appears to be related to experience. It seems reasonable to assume (and the data lend some support) that a cross-country skier needs to acquire a certain level of skill and confidence in the winter environment before he or she becomes involved in winter camping.

We have inferred something of the motivations of cross-country skiers from behavioral patterns and demographic characteristics. Table 6 provides a more direct measure of the reasons skiers took up the sport. The responses were given to an open ended question and more than one reason may have been offered.

Table 6: Original reason participants thought they might enjoy cross-country skiing and first season of cross-country skiing

RELATIVE FREQUENCY (PERCENT) OF REASONS GIVEN

First Season	exercise	fresh air	outdoors	scenery	peace/ tranquility	friends liked	with friends/ family	fun	easy	inexpensive	liked downhill	(N)
prior to 1972-73	(41) 67	(4) 7	(18) 30	(3) 5	(6) 10	(8) 13	(3) 5	(4) 7	(2) 3	(5) 8	(3) 5	(61)
1972-73	(21) 51	(2) 5	(11) 27	(6) 15	(4) 10	(4) 10	(1) 2	(3) 7	(1) 2	(2) 5	(3) 7	(41)
1973-74	(20) 33	(2) 3	(25) 41	(5) 8	(6) 10	(5) 8	(4) 7	(3) 5	(3) 5	(2) 3	(7) 12	(61)
1974-75	(22) 31	(1) 1	(25) 35	(7) 10	(5) 7	(9) 13	(0) 0	(2) 3	(5) 7	(5) 7	(7) 10	(71)
1975-76	(22) 23	(2) 2	(34) 35	(5) 5	(12) 12	(11) 11	(9) 9	(3) 3	(6) 6	(6) 6	(9) 9	(96)
1976-77	(41) 41	(10) 10	(30) 30	(7) 7	(8) 8	(16) 16	(5) 5	(11) 11	(5) 5	(7) 7	(6) 6	(99)
1977-78	(43) 32	(8) 6	(45) 34	(12) 9	(13) 10	(27) 20	(8) 6	(8) 6	(7) 5	(11) 8	(8) 6	(134)

Exercise and access to the outdoor environment have always been important motivations. The importance of exercise appears to be somewhat less than during the early years. The early association may have resulted from the dominant image of cross-country skiing as a physically demanding activity.

Our data show little change during the past five years in the importance of the "outdoors" as an attractor to cross-country skiing. This may reflect a stability in our society's attitudes toward the natural environment and the need to complement daily routines associated with the urban setting.

The influence of friends and relatives shows an interesting pattern; a slight decline from its importance prior to 1972 and then an increase during the past few years. The early importance of peer influence may be an indication of the type of visibility cross-country skiing had at the time. There was little media exposure and most persons heard about ski touring from people they knew. Currently, given the high level of visibility ski touring is experiencing, peer influence becomes more of a factor as participants are drawn from the marginally interested population and the "psychocentrics" or followers.

The Effect of Experience on the Individual's Demand for Opportunities

Our data is not ideally suited to test this relationship. Nevertheless it can provide some insights.

There is a clear relationship between years of experience and self-rated skill level as shown in Table 7. We might expect a similar correlation with the demand for more challenging types of opportunities. Table 8 presents relative preferences for specific environmental characteristics, some of which may indicate a desire for more demanding opportunities.

Table 7: Distribution of self-rated skill level and first season of cross-country skiing

SELF-RATED SKILL LEVEL, RELATIVE FREQUENCY (PERCENT)

First Season	novice	advanced novice	inter-mediate	advanced inter-mediate	advanced	expert	(N)
prior to 1972-73	(9) 15	(11) 19	(18) 31	(14) 24	(5) 9	(1) 2	(58) 100
1972-73	(9) 22	(7) 17	(14) 35	(9) 22	(1) 2	(1) 2	(40) 100
1973-74	(14) 23	(11) 18	(23) 38	(9) 15	(4) 6	(0) 0	(61) 100
1974-75	(19) 27	(20) 28	(21) 30	(10) 14	(1) 1	(0) 0	(71) 100
1975-76	(18) 19	(37) 39	(27) 28	(10) 11	(3) 3	(0) 0	(95) 100
1976-77	(38) 39	(29) 29	(23) 23	(7) 7	(2) 2	(0) 0	(99) 100
1977-78	(71) 53	(35) 26	(22) 16	(5) 3	(1) 1	(2) 2	(134) 100

There appears to be a slight tendency for the newer skiers to have a higher preference for groomed, well marked trails. They are also more likely to find longer trails and remote areas undesirable. On the other hand they don't appear to be too much different in their attitudes toward breaking trail (i.e., making tracks in new, unpacked snow) or trails requiring a high level of skill. Perception of difficulty is, of course, quite subjective. We might expect some consistency with self-rated skill level however.

Our data is inconclusive on the question of how experience affects the desire for challenging opportunities. A number of other factors are probably involved. For example, groomed, well marked trails are much more prevalent now than in the past; thus newer skiers have been conditioned to accept these characteristics as "standard" and a dominant aspect of their image of cross-country skiing.

Table 8: Preferences for selected environmental characteristics and first season of cross-country skiing

FREQUENCY DISTRIBUTION (PERCENT) OF PREFERENCES FOR ENVIRONMENTAL CHARACTERISTICS

First Season	groomed trails	unbroken trails	signs	connecting trails	25 mile trails	remote, hard to reach	high skill required	encounter nobody
prior to 1972-73 (N=61)								
undesirable	9	22	0	7	29	27	36	11
neutral	42	25	33	44	55	40	34	39
desirable	49	53	67	49	16	33	30	50
1972-73 (N=41)								
undesirable	15	30	5	12	34	32	44	20
neutral	27	20	18	34	37	36	39	34
desirable	58	50	77	54	29	32	17	46
1973-74 (N=61)								
undesirable	6	17	10	17	27	25	22	20
neutral	35	37	37	41	43	34	52	49
desirable	59	46	53	42	30	41	26	31
1974-75 (N=71)								
undesirable	7	29	7	13	46	43	41	13
neutral	27	20	29	46	37	30	39	49
desirable	66	51	64	41	17	27	20	38
1975-76 (N=96)								
undesirable	8	24	6	11	39	40	39	18
neutral	30	30	23	44	40	26	37	28
desirable	62	46	71	45	21	34	24	54
1976-77 (N=99)								
undesirable	4	17	6	11	32	41	37	24
neutral	39	41	19	48	51	33	33	54
desirable	57	42	75	41	17	26	30	22
1977-78 (N=134)								
undesirable	7	19	5	12	32	45	42	22
neutral	24	39	20	44	45	28	43	51
desirable	69	42	75	44	23	26	15	27

Those seeking greater challenges may be attracted to the increasingly popular "citizens tour races". These are all comers events where everyone competes against the clock or simply attempt to go the distance. The growth in the number of scheduled events and the number of entrants is ample evidence for the appeal of this kind of challenge. This trend is not reflected in the items contained in our survey.

The best approach to determining changes which have occurred within individual participants may be by means of in-depth interviews. This process would document their life history within the activity and the linkages between changes in attitudes and behavior. For the future we may be able to establish "panel" type studies which follow the development of individual participation. In any case it is difficult to separate internal, self-initiated changes brought about by actual participation from those imposed by changes in the image of the activity as a whole.

SOME ADDITIONAL COMMENTS AND CONCLUSIONS

It should be quite obvious that there is no substitute for a thorough familiarity with the activity(s) under consideration. An understanding of participation dynamics does not lend itself to simplistic formuli or fit a standardized pattern of change. Survey instruments can be designed to answer specific questions within a comprehensive framework. Valid inferences are impossible if the researcher is not aware of the numerous variables which cannot be incorporated into the questionnaire or interview schedule.

Often we can supplement our internal analysis with a comparison to other times and places. Norway, a country similar in size, population, and climate to Minnesota, has a well established tradition of cross-country skiing. The history of skiing in Norway provides some hints as to its potential in the United States. A 1970 analysis of outdoor recreation, sports, and exercise in Norway showed that during that (1969-70) season 52 percent of the population took shorter ski trips, 29 percent took daylong trips in forests and fields and 28 percent took daylong trips in the mountains (these are not exclusive categories). With these rates as a benchmark we can proceed to qualify for the conditions in Minnesota. Minnesota does not have the traditions of Norway. Minnesota does have a well established competitor for the individual's attention, namely snowmobiling. A lot may depend on how actively public agencies develop opportunities and promote the sport. In Norway the promotion of physically demanding forms of recreation is an important part of public policy. Motorized activities, such as snowmobiling, are subject to more restrictions than in the United States.

Prediction is always a risky undertaking -- there are many "ifs" in the equation. A fundamental question is how actively we want to become involved in creating the conditions which effect change. As risky as it is, someone must take the responsibility to make a judgement.

REFERENCES

Ballman, G., Merriam, L.C., and Knopp, T.B. 1979. Interim Response Summary for the 1978 Minnesota Cross-Country Skiing Study. College of Forestry, University of Minnesota, St. Paul, Minnesota.

Christy, F.T. 1970. Elements of mass demand for outdoor recreation resources. In: Elements of Outdoor Recreation Planning edited by B.L. Driver. Ann Arbor, Michigan: University Microfilms.

Dalton, M.J. 1979. Minnesota Cross-Country

Skiers, Report No. 2321. Minnesota Department of Natural Resources, Bureau of Comprehensive Planning and Programming, St. Paul, Minnesota.

Driver, B.L. and Brown, P.J. 1975. A social-psychological definition of recreation demand, with implications for recreation resource planning. Appendix A in Assessing Demand for Outdoor Recreation. Washington, D.C. National Academy of Science. Reprinted by the Bureau of Outdoor Recreation, U.S.D.I.

Driver, B.L. 1977. Item pool for scales designed to quantify the psychological outcomes desired and expected from recreation participation. U.S.F.S. Rocky Mountain Forest and Range Experiment Station.

Fishman, J.A. 1978. A maturing sport faces growing pains. New York Time, December 31, 1978.

Knopp, T.B. 1972. Environmental determinants of recreation behavior. Journal of Leisure Research 4(2):129-138.

Meyersohn, R. and Katz, E. 1958. Notes on the natural history of fads. In: Mass Leisure, edited by Eric Larrabee and Rolf Meyersohn. Glencoe, Illinois: The Free Press.

Plog, S.C. 1974. Why destination areas rise and fall in popularity. The Cornell Hotel and Restaurant Administration Quarterly. Vol. 14: No. 4.

Statistisk Sentralbyro (Central Bureau of Statistics of Norway). 1975. Friluftstliv, Idrett og Mosjon (outdoor Recreation, Sprot and Exercise). Oslo, Norway.

Stynes, D.J. 1980. Interrelationships among three outdoor recreational sports. North American Symposium on Dispersed Winter Recreation, 27-29 February 1980. University of Minnesota, Office of Special Programs, St. Paul, Minnesota.

Tinsley, H.E.A., Barrett, T.C., and Koss, R.A. 1977. Leisure activities and need satifaction. Journal of Leisure Research 9(2):110-120.

West, P.C. 1977. A status group dynamics approach to predicting participation rates in regional recreation demand studies. Land Economics 53(2):196-211.

TRENDS IN THE TEMPORAL DISTRIBUTION OF PARK USE[1]

Robert E. Manning and Paula L. Cormier[2]

The purpose of this paper is to examine trends in the temporal distribution of park use. Plots of daily attendance data trace changes in temporal use distributions over time. A use concentration index quantifies and reduces to a single numerical indicator the degree of unevenness of recreation attendance data. The percent of total annual use accounted for by selected time periods is also examined.

INTRODUCTION

Trends in outdoor recreation are normally monitored on some aggregated level, usually on an annual basis. Participation in hunting and fishing, for example, is commonly monitored through yearly license sales, while snowmobiling and trailbiking activity is measured by annual registrations, and use of parks, forests, and campgrounds is most often reported in visits or visitor days per year. Monitoring of recreation activity at this aggregated level is highly useful in identifying long-term trends in participation and the relative popularity of various outdoor recreation activities, but disregards the manner in which recreation activity is distributed over the reporting period. Paradoxically, it is the typically uneven manner in which recreation participation is distributed over time which presents one of the most pervasive problems in outdoor recreation management.

In the classic case, park and recreation sites open for "the season" on Memorial Day weekend and close on Labor Day. The result is a full year's use condensed into little more than three months. Even within this "season" use may be skewed toward weekends and holidays resulting in a marked "peaking" phenomenon. There are a number of significant problems associated with this typical use distribution pattern. First, to satisfy demand, recreation facilities and services must be developed at a scale to meet peak loads. These facilities and services may go largely unused at most other times, resulting in inefficient resource use. Second, the social carrying capacity of recreation areas may be unnecessarily exceeded by peak loads through crowding and increased potential for conflicting uses. Third, there is preliminary evidence that even ecological carrying capacity may be unduly taxed by excessively concentrated visitor use (Lime 1972). Finally, periodic peaking of recreation use presents substantial administrative problems, particularly with respect to personnel scheduling.

While this peaking problem in outdoor recreation has been recognized for some time (Clawson and Knetsch 1966), there have been few efforts aimed at its systematic study. This is apparently due to the prevailing attitude among recreation planners, managers, and researchers that the temporal patterns of outdoor recreation use are determined by factors which are viewed as largely uncontrollable. Such factors include weather and societal work and leisure patterns. It is the purpose of this paper to report on a cooperative study recently undertaken by the University of Vermont and the Northeastern Forest Experiment Station which seeks to examine trends in the temporal distribution of park use in order to more fully understand this problem. The ultimate objective of this study is to suggest methods by which the use of park and recreation areas may be more evenly distributed over time.

METHODS AND ANALYSIS

The first phase of this study was to develop techniques to quantify the temporal distribution of selected outdoor recreation activities. Development of appropriate measurement techniques is needed to facilitate trend analysis. Three approaches to measurement have been developed to date. The remainder of this section of the paper describes these three measurement techniques, and their application to two data series. One data series traces daily attendance at forty Vermont State Park campgrounds from 1977 to 1979, while

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2]Robert E. Manning is Assistant Professor, Recreation Management Program, University of Vermont; Paula Cormier is Mathematical Statistician, USDA Forest Service, Durham, NH.

the other traces daily campground occupancy at one New Hampshire State Park from 1971 to 1977.

Plotting of Attendance Data

A series of computer programs were developed which graphically plot occupancy data at park and recreation areas. In Figure 1, use of four Vermont State Park campgrounds are plotted as a percentage of peak use by day. The significance of these plots is that they illustrate the peaking phenomenon in a clear and often dramatic way, and indicate visually where use redistribution efforts are needed.

Also of significance is the variety of use distributions represented in Figure 1. Daily plots for all Vermont State Park campgrounds in 1977 could be grouped into the four general types illustrated in Figure 1. Elmore State Park represents a moderately uneven distribution of use, showing consistent weekend and holiday peaking while weekdays during July and August average approximately 50 percent of maximum attendance. Townshend State Park illustrates extreme weekend peaking, while Button Bay State Park illustrates consistent holiday peaking. Lake St. Catherine State Park illustrates a relatively even distribution of use, with campground occupancy remaining above 80 percent through the months of July and August.

This variety of use distributions suggests that the peaking problem may be subject to remedy to some degree through appropriate planning and management. It is likely that some characteristics of either the recreation site or the attendant user groups result in this diversity of attendance patterns. If these characteristics can be identified, then they can be incorporated into planning and management decisions aimed at evening out the distribution of recreation use over time.

Finally, plots of daily attendance data can be used to trace changes in temporal use distributions over time. Figure 2, for example, illustrates a change toward more even distribution of use at Button Bay State Park from 1978 to 1979.

Use Concentration Index

While plots of daily attendance data are a useful graphic measure of recreation use distribution patterns, a more quantitative measure is also needed. For this purpose, the concept of a use concentration index was adopted. The use concentration index was first introduced by Stankey et al. (1976) and applied in a spatial dimension to wilderness recreation use patterns. The purpose of the index was to measure the extent to which wilderness trail systems are used in an uneven fashion; that is, some trail segments are used heavily while other trail segments remain relatively unused. By substitututing the days of a recreation season for miles of trail, the use concentration index can be applied to the temporal dimension as well.

The advantage of the use concentration index is that it quantifies and reduces to a single numerical indicator the degree of unevenness of recreation attendance data. Using data from Elmore State Park (Figure 3), the cumulative percent of use of the campground is graphed by the cumulative percent of days in the season. The days of the season are ranked and graphed in descending order of use, and use is accumulated starting with the day most used. The 45-degree diagonal represents an even distribution of use (e.g. 50 percent of all days account for 50 percent of all use), while the curve plots the actual distribution of use (e.g. 50 percent of all days account for nearly 80 percent of all use). The use concentration index is based on the area between the curve and the 45-degree diagonal as a proportion of the total area above the 45-degree diagonal. The index may take values from 0 (perfectly even distribution) to 1 (perfectly uneven distribution). In the graph for Elmore State Park, the shaded area between the 45-degree diagonal and the curve represents 35 percent of the total area above the diagonal. Therefore, the use concentration index equals .35.

As with the daily plots of attendance, a series of computer programs were prepared to draft and calculate the use concentration index. When applied to both data series, use concentration index values ranged from .12 to .45. This range of values again demonstrates, as with the daily plots of attendance, considerable diversity in the evenness of use distributions among parks.

Index values provide a convenient way to monitor trends in the temporal distribution of recreation use. Figure 4, for example, traces changes in the use concentration index for inland and waterfront campsites at Pawtuckaway State Park, New Hampshire, from 1971 to 1977. One might have hypothesized that recent gasoline prices and supplies would encourage fewer camping trips, but of longer duration, and that this would contribute to more evenly distributed recreation use. Figure 4 indicates that this is not the case, however, at least for Pawtuckaway State Park, and that, in fact, the trend is toward more unevenly distributed use. These results might be explained by speculating that higher gasoline costs and shortages are eliminating some groups of recreationists from the camping market, and the most likely group to be eliminated is those who must travel greater distances to the park. Since it is also the group that is most likely to stay longer (through the mid-week) at the park, their absence from the park is likely to contribute toward more marked weekend peaking.

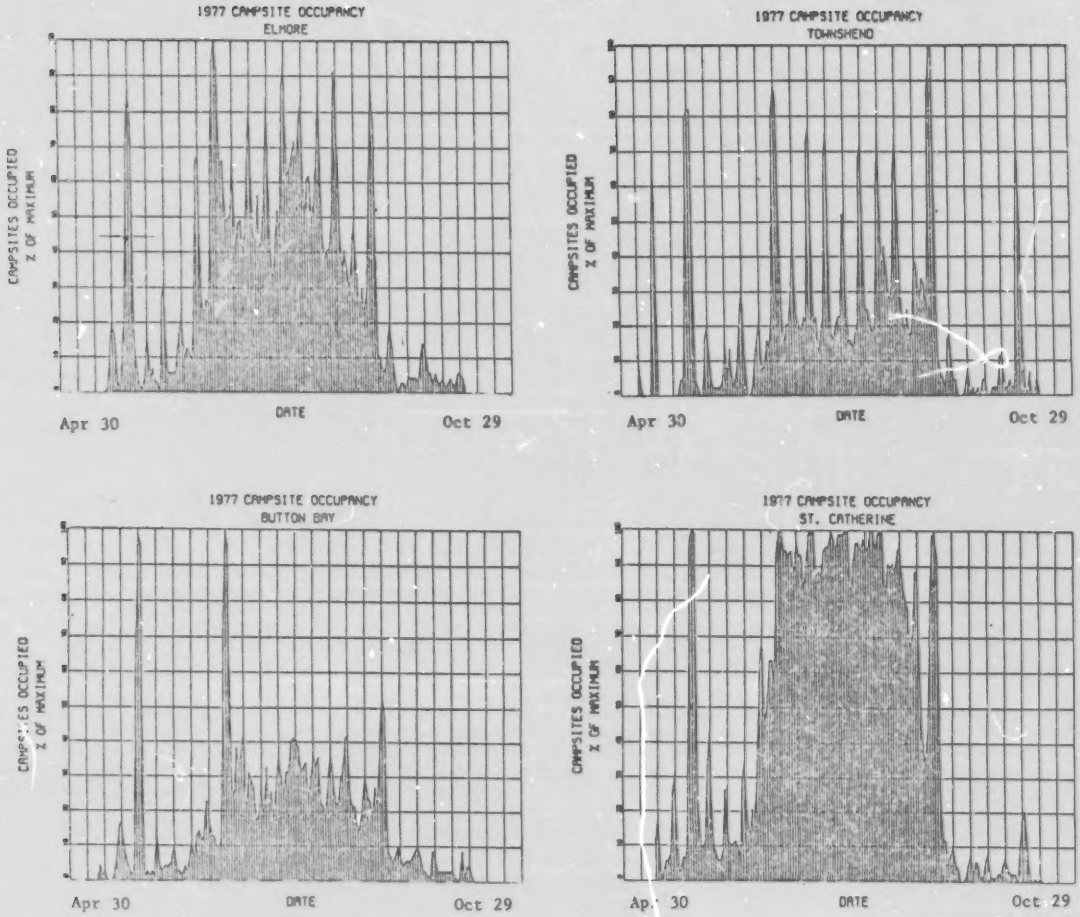


FIGURE 1.--Campsites occupied (percent of maximum) by day for four Vermont State Parks in 1977.

FIGURE 2.--Campsites occupied (percent of maximum) by day for Button Bay State Park (Vermont) in 1978 and 1979.

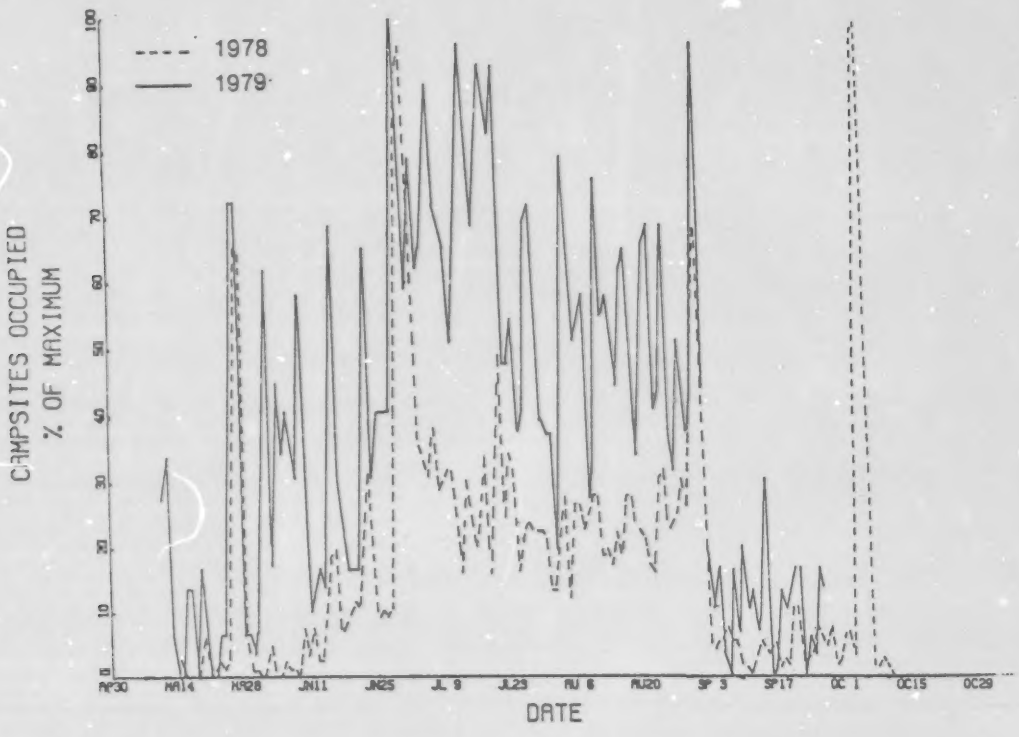
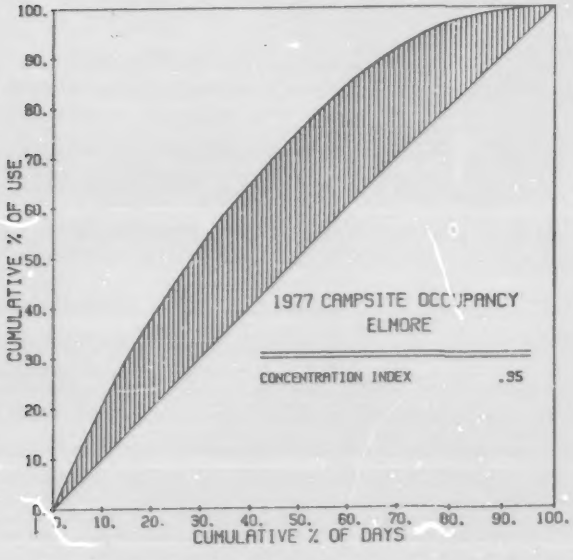


FIGURE 3.--Use concentration index for Elmore State Park (Vermont) in 1977.



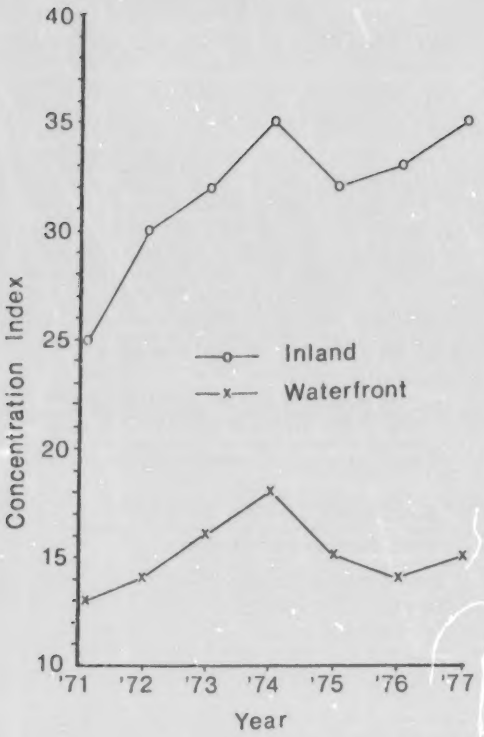


FIGURE 4.--Trends in use concentration index for inland and waterfront campsites for Pawtuckaway State Park (New Hampshire) from 1971 through 1977.

The use concentration index also has considerable potential in contributing to an understanding of why some parks have more even distribution of use than others. When the index is used as a dependent variable in regression analysis, a variety of park characteristics may be examined as independent variables and statistically tested as to their relationship with use distribution patterns. Examples of such park characteristics which might be hypothesized as explaining some of the variation in use concentration index values include distance from population centers, number of campsites, size of park, type and number of recreation activities, and miles of shoreline.

Percent of Use

A third measure of the temporal distribution of recreation use involves calculation of the percent of total annual use accounted for by selected time periods. For example, the percent of total use accounted for by each day of the week provides a measure of how evenly recreation use is distributed over the average week. The bar graph in Figure 5 illustrates the average distribution of use over the days of the week for Button Bay State Park in 1977. The unevenness of the distribution is readily apparent.

Such percentages may also be monitored over time to determine if weekly recreation use patterns are becoming more or less evenly distributed. Figure 6 indicates a trend toward more even distribution of use over the days of the week for Button Bay State Park when examined from 1977 to to 1979. Tuesday, Wednesday, and Thursday account for relatively larger percentages of total annual use, while Friday, Saturday, and Sunday account for declining percentages of total use.

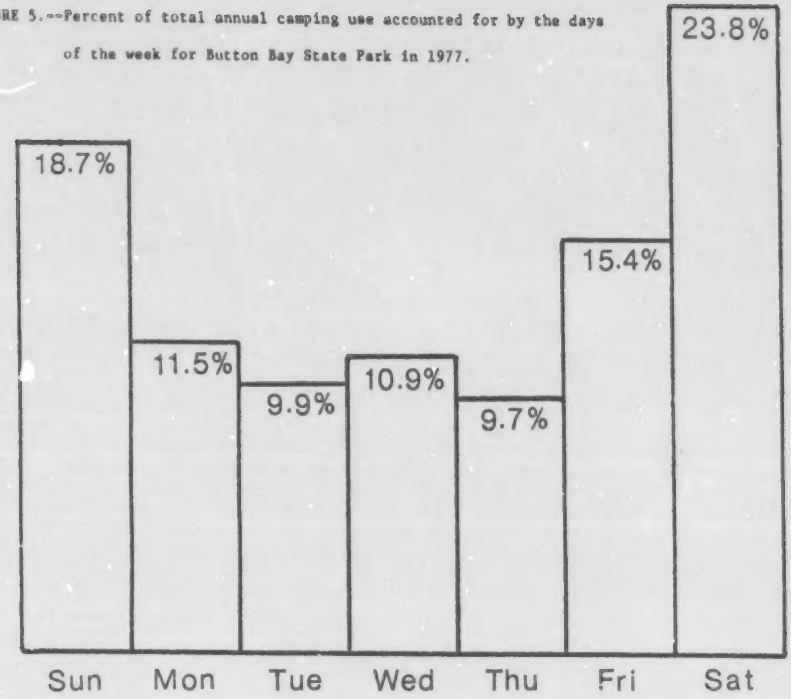
A similar graph was prepared for Pawtuckaway State Park (inland campsites) to trace trends in weekly use distributions from 1971 through 1977 (Figure 7). While trends are not as readily apparent in this case, there appears to be a tendency toward Friday and Saturday accounting for relatively larger percentages of total annual use, and thus for weekly use patterns becoming more unevenly distributed. It is interesting to note in Figure 7 the dramatic changes in the percent of use accounted for by Friday and Sunday in 1974. One might hypothesize that such a change might have been caused by Sunday closings of gasoline stations, encouraging weekend park users to camp Saturday and Sunday nights rather than Friday and Saturday nights in order to purchase gasoline for the return trip home on Monday mornings when gasoline stations reopened.

The percent of total annual use accounted for by seasons might also be an important measure of temporal recreation use patterns. The percent of use accounted for by the summer (Memorial Day weekend to Labor Day), spring (prior to Memorial Day weekend), and fall (after Labor Day) seasons for Elmore State Park from 1977 to 1979 is shown in Figure 8. While the summer season accounts for the largest percentage of total campground use, this percentage appears to be declining with a trend toward an increasing percentage of use during the fall season. Trends toward increasing percentages of total annual use for the fall and spring seasons have also been found for Michigan State Park campgrounds by Stynes and Rottmann (1979).

FURTHER RESEARCH

The three techniques described above -- plots of daily attendance data, the use concentration index, and calculation of the percent of use accounted for by selected time periods -- have proven useful in measuring the temporal distribution of recreation and tracing trends in these distributions over time. These measurement techniques will be applied more widely as additional data series become available so that we might investigate a wide variety of recreation sites and activities, and continue to monitor trends in the future.

FIGURE 5.--Percent of total annual camping use accounted for by the days of the week for Button Bay State Park in 1977.



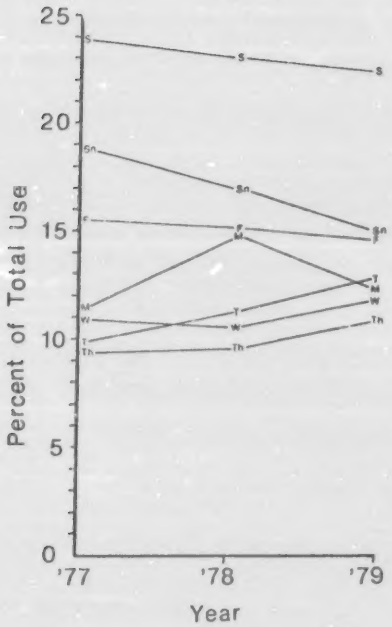


FIGURE 6.--Trends in the percent of total annual camping use accounted for by the days of the week for Button Bay State Park from 1977 through 1979.

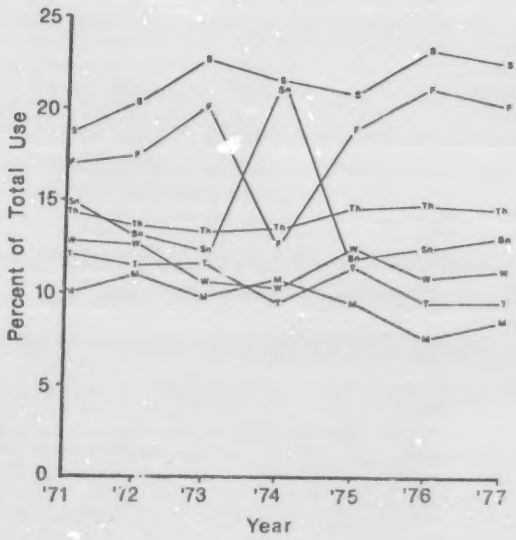


FIGURE 7.--Trends in the percent of total annual camping use accounted for by the days of the week for inland campsites of Pawtuckaway State Park from 1971 through 1979.

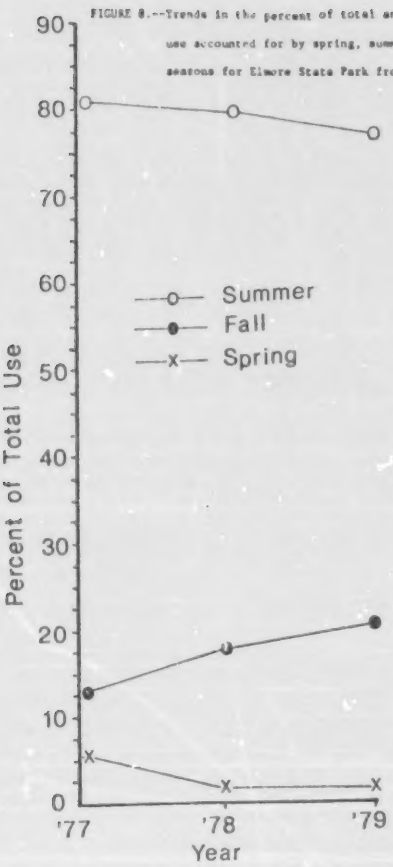


FIGURE 8.--Trends in the percent of total annual camping use accounted for by spring, summer, and fall seasons for Elmore State Park from 1977 through 1979.

A second phase of research will be aimed at explaining why there are substantial differences in the evenness of use distributions among park sites. As noted earlier, the use concentration index provides a convenient dependent variable from which regression analysis may help explain the relationship between park site characteristics and recreation use distributions.

A third phase of research will involve an analysis of recreation users to explore and evaluate selected management and marketing strategies designed to redistribute recreation use more evenly. A random selection of peak and off-peak users will be interviewed at recreation sites and a comparative analysis will be done to identify target markets for redistribution efforts. Both peak and off-peak users will be analyzed with regard to socioeconomic characteristics, stage in family life cycle, work and leisure patterns, recreation motivations and satisfactions, and response to proposed management/marketing efforts such as differential fees, changes in site development level, recreation activities and facilities offered, and dissemination of information on conditions of crowding.

It is hoped that these three phases of research will lead ultimately to a series of suggested recreation planning, management, and marketing guidelines that might be used to reduce the peaking phenomenon in outdoor recreation and result in more even distribution patterns.

LITERATURE CITED

Clawson, Marion and Jack Knetsch 1966. Economics of outdoor recreation. Johns Hopkins University Press: Baltimore.

Lime, David W. 1972. Large groups in the boundary waters canoe area--their numbers, characteristics, and impact. USDA For. Serv. Res. Note NC-142.

Stankey, George H., Robert C. Lucas, and David W. Lime 1976. Crowding in parks and wilderness. Design and Environment. 7(3):38-41.

Stynes, Daniel J., and Kathryn M. Rottman 1979. Trends in seasonality of Michigan state park use. Paper presented at the National Recreation and Park Association Congress, New Orleans, Louisiana.

NETWORK ANALYSIS: A NEW TOOL FOR RESOURCE MANAGERS[1]

Dr. Ruth H. Allen
Assistant Professor
Environmental Systems Management
Center for Technology and Administration
College of Public and International Affairs
The American University
Washington, D.C.

Resource managers manipulate ecosystems for direct or indirect human uses. Examples of relatively well studied resource management issues include familiar biological products such as: forests, ranges, fish and wildlife; or physical products such as air, water and soil. Until very recently, urban environments received much less scholarly attention. However, as Spurr (1969) notes "principles of ecosystem management apply to wilderness and to urban environments".

Within urban environments, it is people, and particularly children who are worthy of new scholarly attention. After all, why bother with long-term resource management, if we ignore the reality of life for today's urban children. They will inherit what ever future resources today's resource managers leave behind. The discussion of network analysis presented here is part of a larger study of nature and urban children, Allen (1977).

WHAT IS NETWORK ANALYSIS?

Network analysis is a new technique to uncover and map information and communication links between two or more people using a particular natural resource. Older forms of network analysis trace inanimate linkages, for example, telephone wires, sewer pipes and transportation corridors. Other human network analyses are to uncover friendship networks, Moreno (1960), political coalitions, Boissevain and Mitchell (1973) community elites, Laumann and Pappi (1976), or urban families, Bott (1977) and Gans (1962).

For this study, the network analysis is based on measured personal associations of urban children, eight to thirteen years of age. All three hundred sixty three children were located outdoors in close proximity to each other while using natural land resources within organized nature recreation, and environmental education programs. All programs serve children from metropolitan, New York, New Jersey and Connecticut. Ordinary, working class urban children, who actually use selected forest environments (parks, camps, nature centers or urban wildlands) are the focus of this study because they have large, accessible social networks. They are also numerous; therefore there are many more children to be served by a decreasing resource base. Moreover, interrelated issues of equity and resource scarcity put added burdens on resource managers and the tools and techniques of resource management.

HOW DOES NETWORK ANALYSIS WORK HERE?

I started this study with a curiosity about the commonplace event of collecting large groups of urban reared children, and moving them to a park, nature center, camp or wildlands for the summer. These events have gone on for a variety of altruistic and youth management objectives for more than one hundred years starting with the newspaper fresh air funds and settlement house outings of Jane Addams.

This study used a series of forested sites with youth outdoor programs to study the role of nature in the lives of urban children. In the study, urban children, were observed over four summers and interviewed on location.

One component of the interview schedule was a sociogram. Respondants were asked to identify companions they would choose for a hike in the woods as an index of the type of association. They are also asked to classify their choices as: relatives, neighbors, school friends or just camp/program friends.

What was different about this study was

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

that in addition to mapping the networks of reported associations, and classifying associates as to social distance a simple, unobtrusive way was devised to index the duration of the reported associations. This was done by superimposing the results of a content analysis of attendance records on to the sociograms previously classified according to kinship or associated more distant social links. Return rates were established by checking attendance lists for two consecutive years, to see who reappeared the second year.

It is estimated from the rate of other errors in attendance records that there was not more than a 2% error, since careful attendance checks are required for safety and funding reasons. However, occasionally in crowded urban day type programs a child not on the attendance list, but who knows the system from a previous year will sneak on a bus "going to the beach" or some other swimming hole.

There are at least three stages in any network analysis. Stage one is the network identification process - in this case, I selected youth outdoor programs of various sizes and types. All programs have similar goals, objectives, clients and environmental resources. Given the nature of the urban children, there are likely to be pre-existing networks worthy of analysis.

Stage two involves mapping identified networks. In this instance desk-top and computerized matrix methods were combined to show structural and functional relationships within existing social networks. Three important dimensions of stage two are keeping track of several hundred subjects, identifying returnees and cataloging pre-existing kinship, friendship, neighborhood and school groups.

Stage three is to understand the results of the network analysis. Here the key insights are derived from the comparison of a range of program types. One surprising finding is the extent of pre-existing networks embedded in these outdoor experiences. This is surprising because program managers act as if all users are new to each other and to the natural system resources.

A. Causes of Bonding

All groups change with time. Returnees slow the rate of change by adding stability and consistency to camp life. Network analysis aims to show why camp groups are cohesive and how group cohesion develops with the life history of individuals. The extent and type of pre-existing groups in camp include: kinship, neighborhood, and friendship groups which contribute to group cohesion and high return rates. Camp programs for urban children mimic the life in small, intimate, rural communities during the last century.

The concept of social networks requries an explanation before a presentation of the findings. Networks are private and more or less permanent structures which bind individuals in complex lines of transportation and communication. Moreno (1960) likened social networks to a "container, a bed which carries and mingles its currents, however different their goals may be". Social networks are important because they carry rumors of sociological current. Because networks are private, it is hard to estimate where they reach, but in the case of nature programs for urban children, it is clear that the reputation of a program and its core staff influence the constancy of return rates. In Moreno's terms, networks are "the kitchens of public opinion. It is through these channels that people affect, educate or disintegrate one another. It is through these networks that suggestions are transmitted."

Moreno devised sociometric tests to examine social structures by measuring the attractions and repulsions between individuals within a group. Moreno cautioned that it is a difficult psychological problem to introduce a sociometric instrument into a small community since it may be painful or unpleasant for a particular individual to find out his position in the group. For the present studies, there was little resistence to a sociometric measure since that measure was only a small part of the total instrument. Preparation for the sociogram came through the rapport developed earlier in the interviews. There seemed to be a little consciousness or resistence among the children to the sociogram items. In both 1972 and 1974, at the end of the interview, each child was asked, in Question 31, "If you could choose three people from camp to go on a hike with you, who would you choose?" After the three choices, children were asked to classify the individual chosen as to whether they were: camp friends, workers at the camp, counselors, school friends, neighbors, or relatives.

The hand analysis of sociometric data consisted of drawing conventional sociograms with circles for individuals or squares for categories of individuals who were not actually interviewed. Returnees are marked by a double circle and dyads are shown by arrows. A dyad is a union of two people. Moreno indicates that the level of social group cohesion is high if the number of dyads is larger than one-half the membership, thus allowing for chains, triangles, stars, and more complex structures to form. By this definition, all the camps are cohesive social

groups.

Computerized analysis of the sociogram results consisted of constructing a matrix for all choosers and all chosen individuals. Each child was scored on the number of choices he or she made, and on the number of times he or she was chosen. The total number of crossovers by age, race, sex, counselor group, and type of choice; e.g., staff, camp friends, school friends, neighbors, relatives. The number of reciprocal and non-reciprocal choices was computed for the entire samples.

Kinship

At the Nature Center in 1972 there were eight pairs of siblings, four groups of three siblings, and one group of four siblings registered. This means that of thirty-two people, eleven had blood relatives in the program. There were three sets of two siblings, one set of a mother and two offspring, and one set of a mother and one offspring Among the urban children registered, there were eighteen sets of two siblings, four sets of three siblings, and three sets of four siblings. Thus, sixty people, or 43 percent of the sample population, had a blood relative in the program.

At the YMCA/YWCA Camp in 1973 there were twenty-three sets of two brothers, three sets of three brothers, and one set of four brothers. There were twenty-nine sets of two sisters, five sets of three sisters, eleven two-member brother-sister combinations, one three-member combination, and two four-member combinations. In this case, 165 children, or over 19 percent of the 859 children registered, had a blood relative attending the program.

Composite attendance figures provided by the Scout Program do not contain information on the number of siblings attending camp together. Occasionally, relatives attend camp together. Two percent of sociogram choices were for relatives. At the Resident Camp Program in 1973 there were twenty-five sets of two same-sex siblings, and two sets of three same-sex siblings. There were also fifteen sets of opposite-sex siblings in pairs, and two sets of three-member brother-sister combinations. This means that ninety-two people, or nearly 38 percent of the 245 registered children had one or more blood siblings in the program. In short, when urban children go to natural environments in organized groups, many of them bring their existing social networks with them. When they return home, camp experiences have high story-telling value. Shared experiences, pleasant or unpleasant, bind groups together into larger social networks or a web of group affiliation. Table 1 summarizes the extent of pre-existing networks.

TABLE I

Results of Network Analysis
Showing Pre-Existing Networks

Program Type	% of Children with 1 or more Sibling Present	Total 1972-73 Registration
Nature Center	44%	72
Museum Program	43%	60
Day Camp	19%	859
Neighborhood House	59%	295
Scout Camps	38%	245

Kinship groups are highlighted in the sociogram in Figure 1. Siblings and cousins present are marked with R for relative. Such blood relationships among children are not immediately obvious because children are scattered across the campsite, and they may have different last names on attendance lists. Therefore, asking a child to categorize choices is very useful.

Neighborhood

These groups were the most conspicuous at the close-knit Neighborhood House Camp. Reported neighbors are shown in Figure 2, along with a high number of returnees. Neighbors were also evident in Nature Center and YMCA/YWCA camps. Neighbors were less frequent in the Scout Camps and Private Camp because these programs draw from a wider geographic area. When neighbors attend camp together, camps become an important extension of urban neighborhoods, and like neighborhoods, are "the place where children are brought up to become members of their own society".

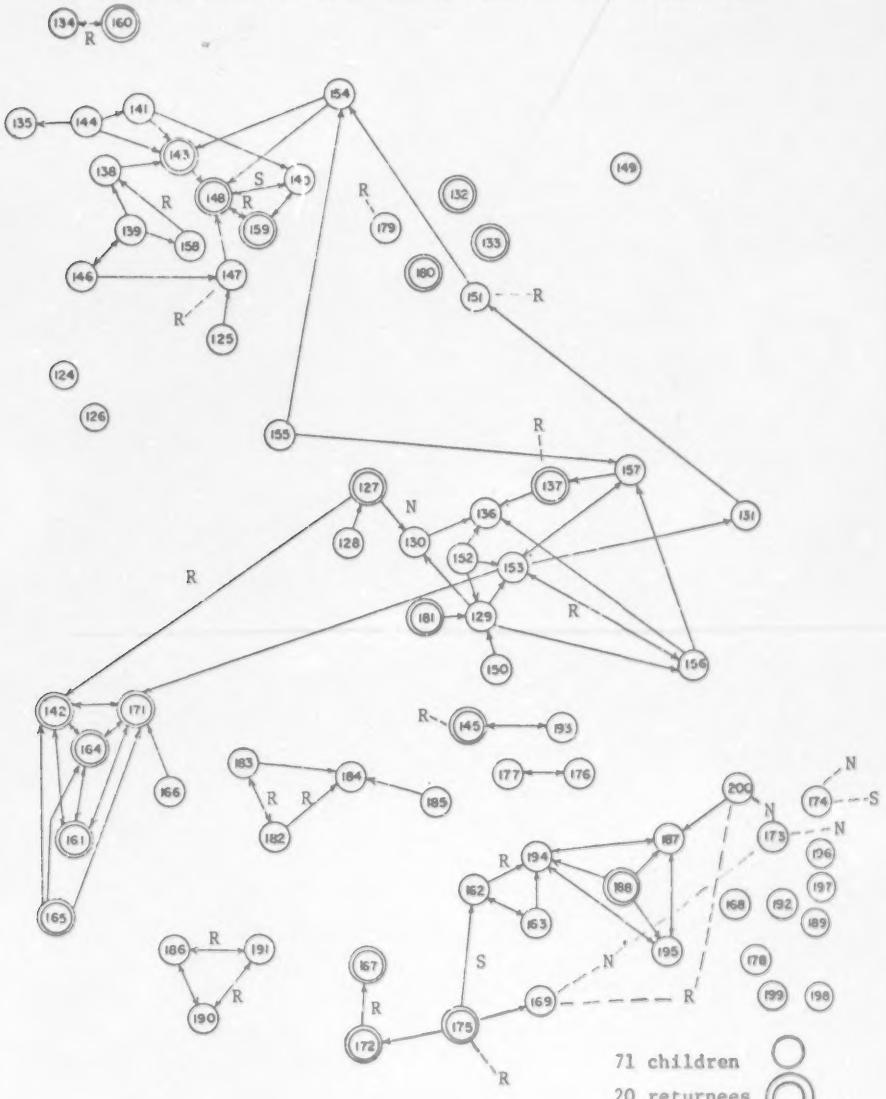
Neighbors live in proximity, by definition, and this may "necessitate many contacts of human beings and cause inurement to and intimate knowledge of one another". This knowledge is transposed to camp, and it affects the children. Neighbors also communicate sentiments and opinions about returning to camp together.

Friendship

This bond "comes most easily into existence when crafts or callings are the same or of similar nature". Friendship, though independent from neighborhood and kinship, requires "easy and frequent meetings". Friend-

Figure 1

YMCA/WYCA PROGRAM SOCIOGRAMS WITH RETURNEES AND KIN GROUPS (R)



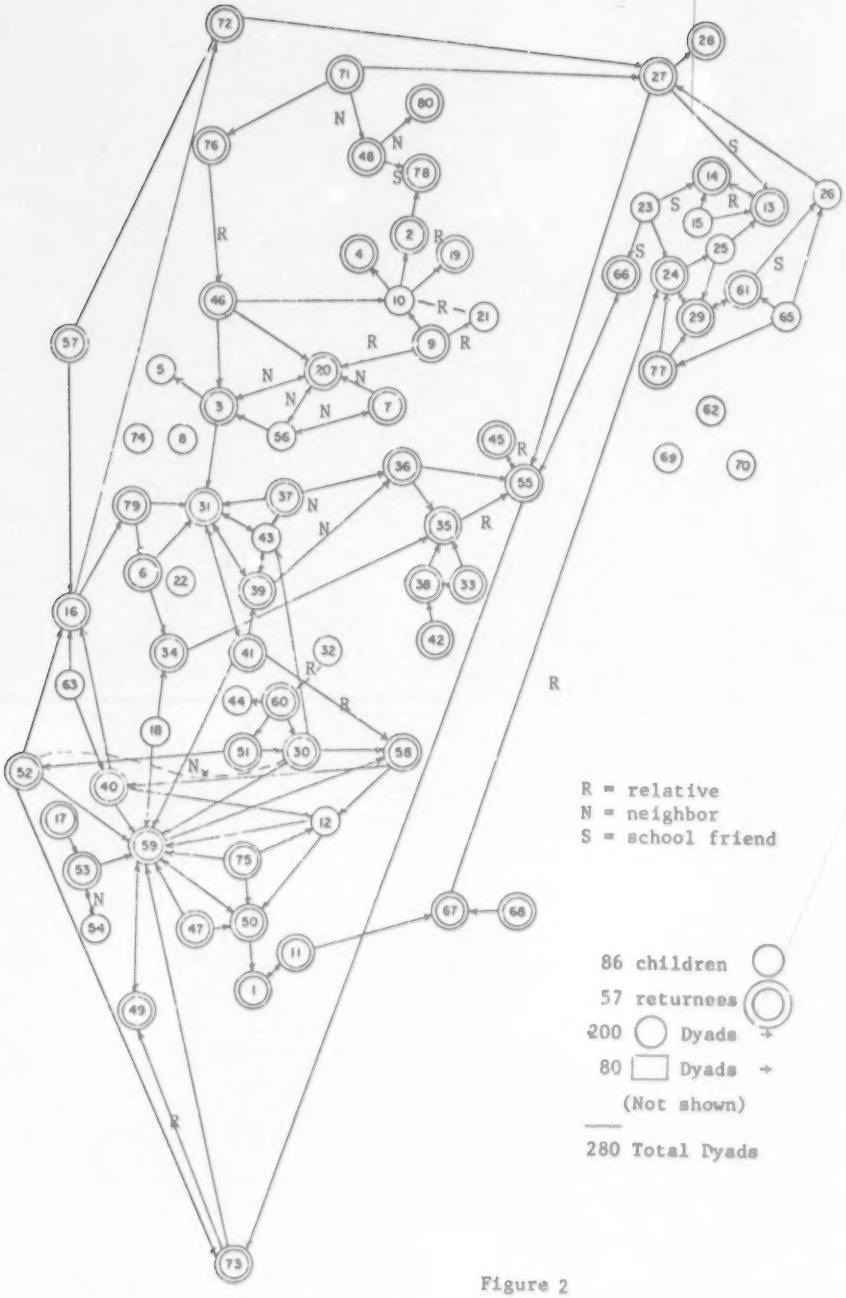


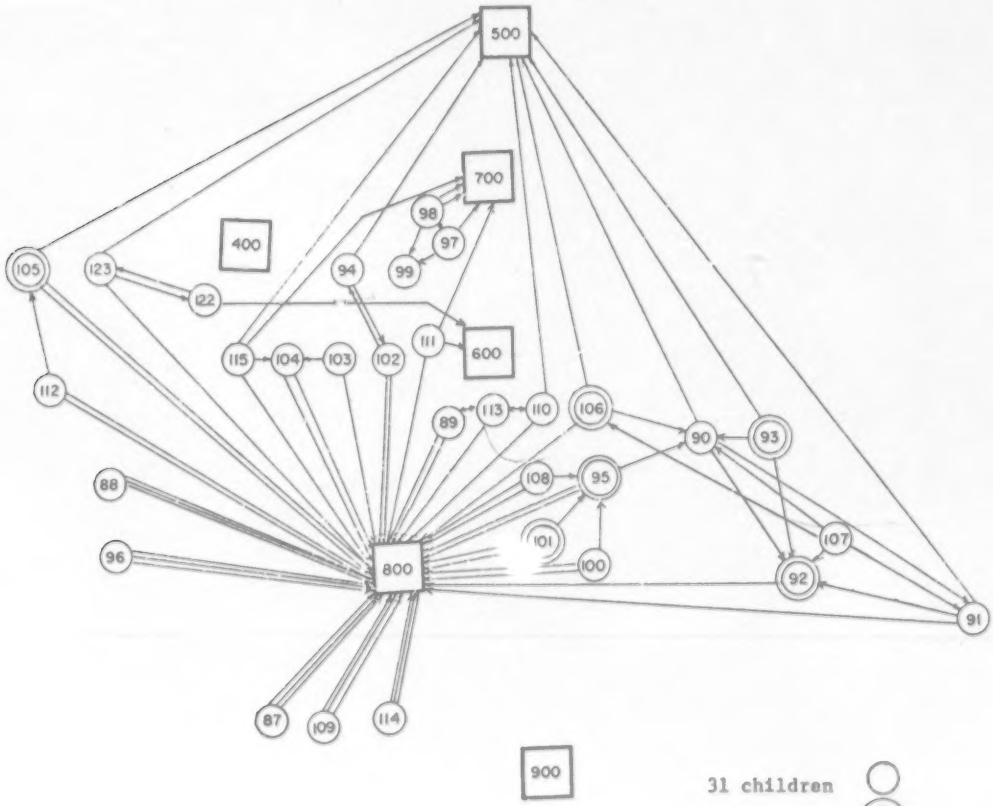
Figure 2

NEIGHBORHOOD HOUSE CAMP SOCIOGRAM WITH
RETURNEES AND NEIGHBOR GROUPS - N

ship among children or junior staff and children is conspicuously illustrated in Figures 2 and 3.

Figure 3

MUSEUM PROGRAM SOCIOGRAM WITH RETURNEES AND C. ER GROUPS



400 = Program Friends
500 = Neighbors
600 = Relatives
700 = School Friends
800 = Junior Staff
900 = Senior Staff, Program Director

31 children
6 returnees
28 Dyads →
58 Dyads →
86 Total Dyads

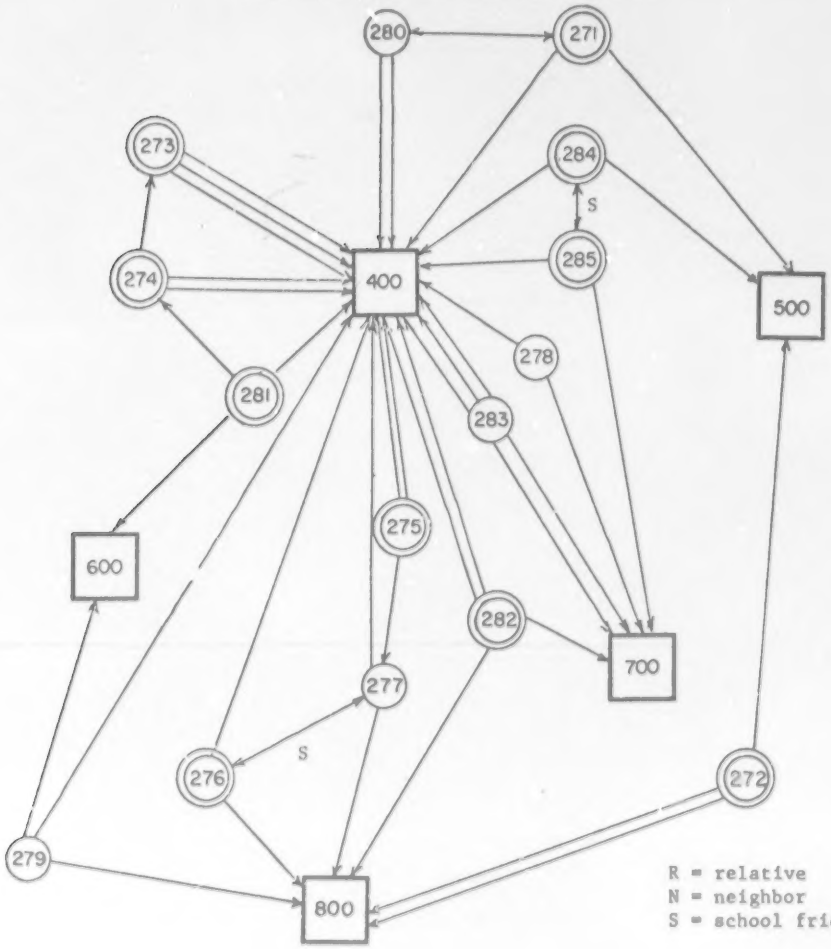
At the Museum Program, forty-two choices were made for junior staff from a total of eighty-six total dyads. There are several possible explanations. Since choices were made on three separate days, in three separate locations, a response groove is unlikely. The task for this sociogram was hiking, and many of these urban children are inexperienced in the woods, so it would be logical to choose companions who have been hiking there before. Finally, unlike most camps where junior staff are predominantly from a higher social class, these junior staff were mainly from the same social, racial, and ethnic groups as the children. This homogeneity in social background could account for such strong friendship bonds.

At the Scout Camps, friendships were conspicuous without reference to kinship or neighborhood groups as illustrated in Figure 4. This finding is consistent with the mission of scouting.

In summary, although kinship extensions are generally dissolved in modern urban families, nature oriented, children's camps may serve as surrogate extended families. Outdoor programs show higher levels of group cohesion because they incorporate preexisting kinship and neighborhood groups. Friendship groups and returnees add further cohesiveness

Figure 4

SOCIOGRAM FOR SCOUT CAMP C
WITH RETURNEES AND FRIENDSHIP GROUPS



400 = Program Friends
500 = Neighbors
600 = Relatives
700 = School Friends
800 = Junior Staff
900 = Senior Staff, Program Director

15 children
10 returnees
9 Dyads
38 Dyads
47 Total Dyads

to groups of children in natural environments.

B. Development of Group Cohesion

How does group cohesion develop in the milieu of children's outdoor programs? Research on returnees suggests that some interrelated factors are important. This is not the simplest explanation, but it best encompasses the evidence. Burch (1971) notes "habitat-societal interactions do not fall into a neat deterministic pattern".

Natural Environments

First, a defined natural territory served as a focus for group interactions and a substrate for group cohesion. Coincidentally, in the Museum Program where territory is borrowed and only in use temporarily, return rates were much lower. None of the natural environments are unique or pristine, but all are available to large number of children. There is enthusiasm and obvious pride in ownership or exclusive use of natural areas, even if use is temporary. However, outside camp preferences for nature per se were rarely mentioned by this sample of children. Six percent of leisure preferences away from camp and 7 percent of preferences within the program were classified as nature-related.

Note that nature means the physical environment or acts having to do with natural scenery, birds, trees, flowers, etc. The Latin root word natura means born, and there are many connotations besides physical environments. Burch writes perceptively of different meanings people give to nature:

The habitats of human societies are not solely the function of ecosystem characteristics. Rather nature is always composed within a specific frame of motive and expectations.... and these selective perceptions determine whether the nonhuman environment will become a resource, a taboo, or remain unseen.

Networks analyses such as the ones in Figure 1-4 reflect the cohesiveness of social groups where many neighbors, school friends and kin-groups co-exist and use resources together. A high number of returnees and a return rate of 35% typify this neighborhood house group.

The highest return rates were found in a year-round nature center. Children walk to the nature center and the return rate is over 48%, although there is a smaller total group size and hence more individualized attention.

Incidently, where children are picked by schools in an effort to equitably distribute a scarce resource, return rates dropped to a little over 6%. Where there is more time in a program over a longer time frame, say 3-5 years, there is a much higher adoption of resource management related careers in later life. Therefore, one of the most subtle but significant long-term outcomes of exposing urban children to nature related resource systems is the nurturing of resource based values and conservation aesthetics. Whether the programs create such values de novo is not clear, but the nurturing function is far more critical.

WHY IS NETWORK ANALYSIS USEFUL IN RESOURCE MANAGEMENT?

Network analysis is useful in resource management because it helps to clarify the following key elements of the human/resource complex:

- the final demand for recreation resources desired by a given society or social group;

- the spatial pattern of resources, potential resources and resource users (both current and future users);

- the quality of the resource related experience;

- the carrying capacity and reuse potential of resources;

- the resource costs and human impacts generated as a byproduct of very intense resource use;

- the interrelationships of resource users to ordinary natural environmental processes and transformations of the resource base with use;

- ambient conditions of overall environmental quality;

- final health, safety and environmental protection measures associated with the use of the land and associated physical and biological resources;

- impacts of resource use pattern changes on plants, animals or people;

- responses of individual elements in the resource use complex;

- local, regional and national governmental and institutional arrangements tied to the resource use patterns; and,

- strategies for implementing changes in

the quality of the resource and the management of future resources in times of increasing resource scarcity.

This approach to resource management is patterned after Bower, (1977).

WHERE DO WE GO FROM HERE?

In a time of declining or stable births, when there are fewer eight to thirteen year olds to be served, resource managers can logically expand the ages and life cycle stages served and/or improve the quality and service given existing populations now served.

The first is a competitive approach, while the second is more cooperative in orientation.

Either approach is better if network analysis is done, at least implicitly. By measuring the user trends, beyond one annual cycle and from year to the next, resource managers can become alerted to the stability elements in the resource complex, eg. returnees enhance the quality of predictability and regularity in this resource complex. In this case, there are indications that lengthy pleasant experiences carry forward into earlier choices and throughout the life cycle into maturity.

However, it is a mistake to believe that the transfer along networks is automatic or always positive.

Dislike for forest resources are conveyed just as efficiently as positive preferences. If we are to better manage dwindling resources, it must be with a careful regard for existing networks of resource users.

REFERENCES

Allen, R. H. 1977. Children and Nature: A Field Study in Sociobiology. Ph.D. Dissertation. New Haven: Yale University.

Boissevain, Jeremy and Mitchell, J. Clyde (eds.). 1973. Network analysis Studies in Human Interaction. The Hague, Netherlands: Mouton & Co.

Bott, E. 1977. In Social Networks: A Developing Paradigm. Edited by Samuel Leinhardt. New York: Academic Press, Inc. pp. 253-292.

Bower, B. T., ed. 1977. Regional Residuals Environmental Quality Management Modeling. Washington, D.C.: Resources for the Future. p. 8.

Burch, W. R., Jr. 1971. Daydreams and Nightmares: A Sociological Essay on the American Environment. New York: Harper and Row. p. 50-51.

Gans, H. 1962. The Urban Villagers. New York: The Free Press.

Laumann, E. O. and Pappi, F. U. 1976. Networks of Collective Action: A Perspective on Community Influence Systems. New York: Academic Press, Inc.

Mead, M. 1972. In Human Identity in the Urban Environment. Edited by Gwen Bell and Jacqueline Tyrwhitt. Baltimore: Penguin Books. p. 245.

Moreno, J. M. 1960. The Sociometry Reader. Glencoe, Ill.: The Free Press. p. 440-450.

Spurr, S. H. 1969. In the Ecosystem Concept in Natural Resource Management. Edited by George M. Van Dyne. New York: Academic Press, Inc. p. 3.

OUTDOOR RECREATION TREND RESEARCH: MAKING THE POSSIBLE PROBABLE[1]

Geoffrey Godbey, Professor
Recreation and Parks
The Pennsylvania State University
University Park, PA

Outdoor recreation research has largely ignored the fundamental requirement of science that findings be replicative. "The only way to establish replicability, of course, is to replicate."[2] Because of this, we know practically nothing about outdoor recreation trends. "Trends, in statistics, (is) a steady change in a variable or set of related variables in a certain direction (for example, a steadily increasing magnitude or frequency of occurrence of a variable) for a period of time."[3] Any definition of trend implies the systematic observance of a phenomenon more than one time. This time period must be one that is great enough that it does not measure merely cyclical fluctuation. The Dictionary of Sociology alludes to this in defining a secular trend: "A long-term trend, that is, a trend that permits for a long enough period of time so that it is clearly not merely a phase of a cyclical movement. Cyclical fluctuation may occur in the course of a secular trend, but there is always a clear, long-range movement in a certain direction despite the short run variations."[4] In outdoor recreation research, for example, we might find that camping in developed areas varied cyclically according to whether it was a week day or week end and according to month of the year, but no secular trend can be established unless we measure such camping in more than one year.

Trend analysis should be understood as one form of aggregation. Aggregation accomplishes two purposes: it reduces errors of measurement and it establishes a range of generalization. Perhaps the most common form of aggregation is aggregating over individuals to reduce errors of measurement associated with individual differences.[5] Thus, we are likely to seek to sample among subjects with reference to individual differences which may constitute variables which intervene upon the relation between the dependent and independent variable.

Another form of aggregation is aggregation over stimuli and/or situations to reduce error variance associated with the unique contribution of specific stimuli or situations and determine the class of stimuli or situations to which the results can be generalized.

Thirdly, we may aggregate over different research measures to minimize variance associated with a single method rather than true variance.

When we replicate a study we are aggregating over trials or occasions since, not only may there be high component of error of measurement, but also since otherwise there is no way of determining whether the results can be generalized over time.

Ideally, research in outdoor recreation would seek to aggregate in all four of these areas, but historically it has only usually attempted to aggregate over only individuals and occasionally over stimuli or situations or measures. The scant attention to replication (aggregating over trials or occasions) means we know little about change and the direction of change in outdoor recreation. The consequences of this situation are great. For instance, we have little idea if the satisfaction levels of users of national parks have increased or decreased in the last decade. We don't know if tennis is more popular this year or last. It is not possible to say if income is a better prediction of participation in water skiing now than it was a decade ago. Is crowding more or less a problem in the mind of state park users than it was five years ago?

A number of situations explain why so

---

[1] Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2] Seymour Epstein, "The Stability of Behavior: Implications for Research," in press, 1980. American Psychologist.

[3] George A. Theodorson and Achilles G. Theodorson, Modern Dictionary of Sociology. New York: T.Y. Crowell, 1969, p. 442.

[4] Ibid, p. 443.

[5] op cit, Epstein, p. 19.

little replication of outdoor recreation research takes place. Such explanations are more in the political, financial and organizational realm than in the methodological realm.

SITUATIONS MITIGATING AGAINST LONGITUDINAL RESEARCH

While a number of methodologies exist for conducting longitudinal research, the following situations have usually meant outdoor recreation research has been largely cross-sectional.

1. Replication of studies has generally been considered low status by social scientists. Many journals won't publish replications of existing studies.

2. Funding for outdoor recreation is usually extremely tenuous. The researcher is often encouraged to "do something quick".

3. Research done in-house by government agencies concerned with outdoor recreation is politically sensitive and subject to change without notice. No state or federal agency can guarantee that a program of outdoor recreation will last for longer than four years at most, and usually for not more than one. New administrators, new researchers, new financial situations, changes in political constraints, demands of agency constituencies -- all these factors mitigate against trend research. As the Committee on Assessment of Demand for Outdoor Recreation Resources of the National Academy of Sciences put it:

"Although surveys have been a dominant form of data gathering and analysis in outdoor recreation for many years, much of the richness of the resulting information has been lost because of lack of comparability of survey questions and sampling methods over time and over geographic areas as well as the limited scope of these inquiries. The ability to detect trends and changes in perceptions, attitudes and preferences vis-a-vis outdoor recreation has been limited by the lack of comparability of sample design and questionnaire format over time."[6]

Surveys undertaken by the (then) Bureau of Outdoor Recreation in 1960, 1965, and 1972 illustrate this problem. As a recent, extensive assessment of these studies concluded:

"The biggest problem in these surveys were the biases which affected responses. Using 1960 as a base, the 1965 survey had a somewhat positive bias, while the 1972 survey had a definite negative bias in reporting of activity participation. These biases, in large part, were due to the inconsistency of survey design over time. This inconsistency affected comparison."[7]

4. A related problem is the lack of systematic data storage, which means that it is often impossible to fully compare replicated surveys with the original data base. It should be noted that some steps are being taken to help minimize this problem. First, an attempt is being made to establish a National Leisure Archive by HCRS, U.S. Department of Interior in cooperation with the University of North Carolina Institute for Research in Social Sciences.[8] Initially, the project will focus upon studies generated by State and Federal governments. All data archived will be available to member institutions of the University of Michigan's Institute for Social Research without charge.

A second project, the establishment of a Leisure Information Network, holds promise for data storage pertaining to leisure at an international level.[9] At a recent conference in Brussels sponsored by the World Leisure and Recreation Association and the European Leisure and Recreation Association, the first steps toward international storage and dissemination of data were undertaken. A linking of existing centers storing leisure data is already being explored, as are other related undertakings. The success of both these projects remains to be seen.

5. Also related is the problem of incomparability of operational definitions from study to study. While attempts have been made to establish a thesaurus of outdoor recreation term, to date, walking for pleasure, hiking and backpacking may have overlapping meanings or even be used interchangably from study to study. The same problem exists with regard to unit of measurement. No commonly accepted interval or ordinal measures have emerged in regard to participation or other subjects of inquiry. One reason for this is a lack of agregation of methods in such research which

---

[6] Committee on Assessment of Demand for Outdoor Recreation Resources, National Academy of Sciences, Assessing Demand for Outdoor Recreation, Washington, D.C.: NAS, 1975, p. 42.

[7] Kirschner Associates, Inc., Interim Report--Evaluation of Five Previous Nationwide Citizen Surveys, Washington, D.C.: unpublished, 1975, p. 111.

[8] National Leisure Archive, John Peine, Project Coordinator, HCRS, U.S. Department of Interior.

[9] Leisure Information Network Conference, Gerald Kenyon, Chairman; University of Waterloo, Waterloo, Ontario, Canada.

makes any judgements about measurement effects purely speculative. While the issue of validating such measures is important, any measure which is replicated at least has the advantage of producing a consistent error. Perhaps this is one reason why many commercial organizations concerned with outdoor recreation will pay high prices for the results of periodically replicated surveys of participation undertaken by A.C. Neilsen and other private-sector pollsters.

6. Social science changes its focus with regard to outdoor recreation, as with other subjects, and such changes often lead to discontinuity. Research concerns such as crowding, motivation and satisfaction, and life stage and life cycle ebb and flow in popularity as well as evolve and such change discourages trend analysis.

These and other situations, many of which are not unique to outdoor recreation, have discouraged research into outdoor recreation trends. It would appear, however, that many things can be done to promote such research.

PROMOTING TREND RESEARCH

Given the previously outlined problems, what can be done to promote outdoor recreation research which is more than purely cross-sectional? It appears that few of the answers involve breakthroughs in methodology.

1. One step in the right direction would be to encourage outdoor recreation researchers to alter cross-sectional research designs to include retrospective or projective aspects. "It is possible in many cross-sectional surveys to incorporate certain characteristics of a longitudinal approach by conducting a retrospective pretest in which respondents are asked to recall their attitudes or behavior at any earlier point in time as well as the present."[10] Additionally, surveys can ask respondents to project future behaviors. While those steps will not, strictly speaking, produce trend data, they will give implication as to the direction of change of the phenomenon under study.

2. Those who promote, plan, fund and advise outdoor recreation research can encourage the replication of existing studies. Within colleges and universities, this may involve encouraging replication of worthwhile theses and dissertations as well as secondary analysis of two or more identical or similar data sets. In local, State and Federal Government, officials need to be made aware of the wastefulness of many of the cross-sectional research efforts which they undertake. There is also the need to inform officials of the benefits of replication of studies to outdoor recreation planners and managers. Among such benefits are economy and simplicity as well as the benefits of identifying trends.

At the state level, the State Comprehensive Outdoor Recreation Plans provide an opportunity for replication which could be systematically encouraged by HCRS. While standardizing SCORPS among states is neither possible nor desirable, replication, in an era of diminishing funds, could be very attractive to individual state outdoor recreation agencies.

At the federal level, it seems unlikely that research done in-house can be planned for more than four years. It may be possible, however, to give funding priority to longitudinal research and the replication of existing studies. Additionally, federal funding can be used in combination with other funds to establish a research-oriented center for the study of outdoor recreation or leisure behavior. Such an intermediate organization would potentially have advantages of stability and a minimum of political interference which could facilitate a long-term program of trend research. To date, no such center exists which is financially secure.

3. In the public, private and commercial sector, greater research efforts of a trend analysis nature can be made using data which is already being collected. Data concerning leisure monetary spending, attendance at state parks, and other subjects is often collected but never analyzed.

4. A more systematic attempt at data storage and dissemination may continue to be problematic in spite of the encouraging preliminary work concerning a National Leisure Archive and the Leisure Information Network. Underlying this problem is the continued lack of a single organization with both resources and a deep and stable commitment to recreation and leisure research. Much of the "non-comultive effect" of recreation and leisure research reflects this situation.

5. In longitudinal research involving panels of respondents, outdoor recreation researchers can urge the inclusion of limited questions pertaining to outdoor recreation. To date, most of the valuable longitudinal data collected about recreation and leisure has come from studies whose primary concern has been some other subject. This situation is likely to continue.

---

[10] Gerald Ferman and Jack Levin, Social Science Research, New York: John Wiley and Sons, 1975, p. 42.

6. Whenever it appears intellectually legitimate, outdoor recreation researchers can utilize the same definitions, units of measurement, sampling procedures and methods of analysis of past studies. In many instances, for example, changes in activity descriptors or scaling of periods of recall have not advanced understanding since no attempt was made to validate either those measures which were discarded or those measures which replaced them. In other words, if you don't attempt to validate the measures you use, use someone else's.

In all these ways and others, outdoor recreation researchers can move closer to establishing trends in outdoor recreation. While methodological innovation may be necessary, the most important constraints appear to be a) the attitudes of outdoor recreation researchers; b) finanical constraints and c) organizational and political constraints. Progress in minimizing these constraints will necessitate expanding the consciousness of both users and producers of outdoor recreation research to the benefits of and need for trend research. Only then will the possible become probable.

TRENDS IN FEDERAL LAND ACQUISITION, PROTECTION STRATEGIES, AND PLANNING

Warren Brown[1]
Resource Policy Analyst
Division of Federal Lands Planning,
Heritage Conservation and Recreation Service
Washington, D.C.

INTRODUCTION

In the past, Federal land acquisition has been one of the most popular ways to protect outstanding natural resources and provide recreational opportunities. Federal purchase, maintenance, and operation can help take pressure off the State or local budget. Federal involvement also can provide a way for local officials to avoid making some tough decisions about regulating private development. However, several trends are raising obstacles to proposals for establishing new Federal management units in the years ahead.

First, and most obvious is the budget crunch. Appropriations for Federal land acquisition have been reduced substantially, in spite of increasing numbers of new projects and proposals. Second, financial constraints and changing public attitudes about Federal land management have encouraged a trend toward finding and using alternatives to fee-simple purchase. These factors have led to some new directions in policies and planning procedures which will be discussed as a third trend in recreation programs.

Financial Constraints

The Land and Water Conservation Fund provides the primary source of support for Federal land acquisition. The Fund was established in 1965 with the broad purpose to:

> "assist in preserving, developing, and assuring accessibility . . . to such quality and quantity of outdoor recreation resources as may be available and are necessary and desirable . . . to strengthen the health and vitality of the citizens of the United States ..."[2]

The LWCF Act emphasized the lead role of the States in providing recreational opportunities and established the 50/50 matching grant program of Federal assistance for land acquisition and development. The Act also recognized the important role played directly by the Federal government in acquiring land for National Parks, Wildlife Refuges, Forests, and Recreation Areas.[3]

The LWCF originally was authorized at $100 million each year through 1989 with at least 40% available for Federal purposes. This level of funding may have seemed adequate in 1965, but new acquisition projects and rising land prices have continued at rates never before anticipated.

In 1970 the authorized level of the LWCF was increased to $300 million each year. By 1980 the level had been increased to $900 million annually. However, claims against the Federal side have increased to $2.9 billion.

Receipts from Outer Continental Shelf oil and gas leases now provide most of the income to support the Fund. Nevertheless, price escalation is eroding the purchasing power of the funds which are available. In 1963, the average cost per acre for Federal purchases was estimated to be $75. During the first 14 years of the LWCF program the average price per acre paid by Federal

[1] Paper presented by Warren Brown, Resource Policy Analyst, Division of Federal Lands Planning, Heritage Conservation and Recreation Service Outdoor Recreation Trends Symposium, Durham, N.H., April 23, 1980.

[2] Land and Water Conservation Fund Act of 1965, Sec. 1 (b).

[3] Bureau of Outdoor Recreation, "The Land and Water Conservation Fund: Intent and Accomplishments", National Urban Recreation Study Technical Report No. 9; July 1977.

103

Agencies was $691.[4] In 1965 - 66 the value of farm real estate was increasing at a rate of 3% each year.

In 1978 - 79 the price of farmland went up 16% on average around the nation with rates above 20% in many western states.[5]

These data show some simple trends which should come as no surprise. Prices are going up rapidly and new demands are being placed on the funds which are available. Appropriations for the Federal land acquisition program have not been able to keep up with rising prices. Assuming a modest 14% rate of land price escalation, even if Congress appropriates the full $360 million authorized for the Federal side of the LWCF each year through 1989, there will be enough money to buy less than one half of the land already identified for purchase.

In spite of the shortage of money, there is no shortage of additional areas deserving protection or the willingness of Congress to establish new acquisition projects.

Alternatives to Fee

Money is not the only obstacle to the Federal land acquisition program. State and local governments frequently oppose Federal purchases which remove land from the tax rolls and economic base. Landowners frequently don't want to sell and are becoming well organized to voice their interests. Although the "Sagebrush Rebellion" has focused on State control over current BLM lands, it is another sign of the growing opposition to the Federal land managing presence

The General Accounting Office recently released a report entitled "The Federal Drive to Acquire Private Lands Should be Reassessed."[6] GAO's image of the Federal "drive" and its criticism of agencies' land acquisition programs are somewhat exaggerated. For example, since 1965 Federal agencies under the LWCF program have purchased about 2.6 million acres - only about one-tenth of one percent of the nation's land. Nevertheless, the GAO report has become one of several factors simulating a review of the Federal land acquisition program, encouraging more attention to alternatives to direct purchase and management.

"Alternatives" in land acquisition have usually been limited to the question, "to buy or not to buy." Different boundaries also have been considered as the only real "alternatives" for the extent of purchase. In the years ahead we can expect more serious consideration to a wide range of techniques which do not necessarily involve direct Federal acquisition or management. These alternatives include many different approaches, some well tested and others quite new, which fall into several categories.

At one end of the spectrum, there is the educational and awareness approach which attempts to promote public and landowner stewardship. State Heritage programs and the National Landmarks Program administered by HCRS provide examples of how private recognition, may be persuaded to voluntarily protect their land. Although these programs are primarily oriented toward protecting natural areas, they can help conserve a landscape, geological formation, or other resources with important recreational values as well.

Coordination and consistency requirements can provide a useful complement to programs of education and recognition. The Coastal Zone Management program provides one example of an effort to assure that Federal financial assistance and licensing activities are consistent with a comprehensive plan which includes at least some attention to recreational values. The Statewide Comprehensive Outdoor Recreation Plan may be so general that "consistency" is difficult to enforce, but in many instances improved coordination in Federal programs through the SCORP can help protect areas of special recreational value. By targeting a variety of other Federal programs of financial and technical assistance it may be possible to avoid the need for direct Federal purchase and management.

Several types of administrative arrangements or techniques are available to help implement voluntary and cooperative methods of protecting recreational resources. A Memorandum of Understanding or Agreement can provide additional support for less formal arrangements for coordination and consistency in actions by Federal or State agencies. For example, HCRS has a Memo of Understanding with the Environmental Protection Agency to help assure that recreational factors will be considered in planning for wastewater treatment.

Contracts and service agreements also provide administrative approaches to providing recreational opportunities. The cooperative

[4] Data from HCRS, Div. of Fed. Lands Planning Files.

[5] U.S. Dept. of Ag., Economics, Statistics, and Cooperatives Services, "Farm Real Estate Market Developments", March 1980. See also, Bureau of Outdoor Recreation, Recreation Land Price Escalation, Jan. 1967.

[6] U.S. General Accounting Office, The Federal Drive to Acquire Private Lands Should be Reassessed, Report CED-80-14; Dec. 14, 1979.

management program conducted by HCRS is one example of how an administrative agreement can open for public use some Federal lands owned by the military or other agencies not primarily concerned with recreation. At the State and local level, an agreement to pick up trash or provide minor maintenance services may be all that is needed to make an area available for public recreation.

Regulatory tools are another category of methods for achieving recreational objectives. Zoning, and building or public health codes can control development to protect open spaces and conserve natural resources. Innumerable combinations of zoning and subdivision controls are available to meet the challenges posed by most rapidly-developing areas. Creative use of clustering, planned unit development, and site plan approvals can help guide growth in a way that keeps important open spaces available for public use. By establishing mandatory dedications, set-backs, reservations, and other contributions toward public services, local governments can assure that new developments make a positive contribution toward providing recreational opportunities.

Air and water quality regulations at the Federal, State, and local levels also can in some cases provide viable alternatives to acquisition. The Corps of Engineers Section 404 Permit program provides an example of how regulatory techniques can protect wetlands which are critical to recreational values as well as important natural processes.

Regulatory, administrative, and educational techniques have their place, but in some cases the recreational objectives require a degree of control or public access that can be achieved only through acquisition. Where purchase is necessary, it may be possible to buy something less than the full fee.

Looking at property ownership as a "bundle of rights", it is possible to acquire only those interests in land necessary to achieve certain objectives. Development, timber, water, mineral, grazing, or other rights may be all that the public needs to own in order to protect important natural areas or recreational and scenic values. These rights may be obtained by purchasing an easement that restricts the owner's activities. However, easements also may be positive, for example by establishing a public right to access.

In England and Wales a network of more than 140,000 miles of footpaths and bridleways provides for public access and recreational use across private lands. These public right-of-way go back to the earliest periods of common law and history, but they have been kept open by citizen activism and dedication.[7] In the United States, affirmative easements have been used to provide public access for hunting and fishing, nature study, and other recreational uses on a limited scale.

Partial interests in land also can be retained when it is sold. Reserved interests in the form of life tenancy for the previous owner are not unusual when the Federal government buys land. Purchases with subsequent re-sale subject to deed restrictions provides another way to get only that interest in the property which is absolutely necessary. Purchase and lease-back arrangements also are available to most Federal agencies, but these methods have not yet been used extensively as an alternative to fee-simple purchase.

If acquisition of fee or less than fee interest is desirable, there are many ways to go about it. Because of tax benefits available, many people can be encouraged to donate all or part of their land or to sell at a bargain price. Public spirit and the tax benefits can also encourage donations of conservation easements. Land exchanges provide another way for public agencies to obtain land they want without giving up cash.

Choosing the Best Technique

In brief, there are a tremendous number of alternatives to acquisition. The problem facing the resource planner or manager is, which one should I use? Indeed, the challenge of the years ahead is to develop and enhance "craftsmanship" in formulating land protection strategies. There is no simple formula to say that easements are "better" than full fee or that regulatory approaches work when educational efforts fail. Each case must be evaluated on its own merits considering several basic factors:

First, the character of the resource must be considered. An area suitable for intense public use will require different strategies from a fragile ecosystem where recreation is a secondary and relatively minor value. Location, accessability, and natural characteristics must be reviewed on a case by case basis.

Second, management objectives must be clearly defined with precision. The type of activity planned will usually determine what interests in land need to be acquired or protected. A scenic vista may be protected by zoning for agricultural use, at the expense of

[7] See remarks of Robert L. Herbst, Assistant Secretary for Fish and Wildlife and Parks, U.S. Dept. of the Interior, at the Sierra Club Board of Directors Meeting, Nov. 11, 1978. San Francisco, California.

more opportunities for public access which could be available with easements or other types of development controls. Although intense public access usually requires public ownership, it may be possible to limit purchase or controls to a few trails or corridors to provide recreational opportunities.

Landowner interests and market conditions also are important in selecting appropriate tools. Where development pressure is weak, it may not be difficult for educational approaches to work. Where rising taxes and growth potential are strong, landowners are less likely to voluntarily give up any rights to the land they hope to develop.

Finally, political realities are an important consideration too often overlooked or misinterpreted in selecting an appropriate technique. Many of the most appealing ways of controlling impacts on recreational resources are simply not feasible politically. Zoning which is well accepted in many metropolitan areas may still seem to be an unthinkable intrusion on private property rights in some rural counties.

Sensitivity to political reality is important, but we cannot be too shy about proposing innovative approaches for fear of adverse reactions. Where opposition is expected to arise, it may be possible to generate the necessary popular support before a protection strategy is dropped as politically impractical. Although many alternatives to acquisition may generate political controversy, there may be even more opposition to Federal or state acquisition of private land. Sometimes politically sensitive regulatory approaches may prove to be a popular substitute for direct acquisition and displacement of current owners.

Policies and Planning Procedures

In response to the financial and political constraints on direct Federal land acquisition new trends in policies and planning procedures are developing. In the past, each Federal agency has followed its own policies and procedures in planning for new national areas and determining what protection techniques will be used. Following recommendations of the Third Nationwide Outdoor Recreation Plan, some important steps have been taken in recent months to improve the new area study process and help assure that agencies using the Land and Water Conservation Fund consider a full range of alternatives to fee-simple acquisition.

First, a Memorandum of Understanding has been adopted by the Directors of the Bureau of Land Management, Fish and Wildlife Service, Heritage Conservation and Recreation Service, National Park Service, and the Chief of the Forest Service outlining the responsibilities of the Land and Water Conservation Fund Policy Group (LPG). The LPG recommends on how the Federal side of the fund is to be allocated each year and coordinates the studies of potential new areas. The group is composed of the agency Directors and is chaired by the Deputy Assistant Secretary for Fish and Wildlife and Parks.

The LPG has been operating in a different form since 1974 primarily to formulate budget requests. Under its new mandate, the LPG will play a more active role in recommending what areas will be studied, who will conduct the studies, and what areas should be recommended for acquisition or other types of Federal protection.

The LPG has adopted a planning and decision-making process to carry out its responsibilities concerning studies of potential new national areas or major expansions in existing areas which might draw on the LWCF. The planning process begins with an emphasis on systematic inventories to examine the entire range of valuable resources and identify the most outstanding examples of natural, cultural, and recreational areas. The process establishes two levels of study for specific sites. First, a Reconnaissance Survey is conducted to collect basis information about characteristics and resources. This data is reviewed by the LPG to determine if the area merits Federal attention. If it does appear to meet the standards, which consider resource quality, integrity, threats of adverse impacts, and other factors, a more detailed study of protection and management alternatives will be conducted.

The analysis of alternatives will consider how existing Federal, State or local planning and regulatory authorities could be used to protect the area. Zoning, permit requirements, and other police power techniques discussed above will be explored. Alternatives to acquisition of full fee including purchase of easements, and timber, mineral, water, or other rights will be considered. The study also will examine some creative acquisition methods including the use of tax incentives to encourage donations, exchanges, or bargain sales. The findings of the study will provide the basis for recommendations on appropriate Federal, State, or local assignments of responsibility for management and, if necessary, new legislative authority from Congress.

The LPG also has adopted a policy statement to guide the new area study process. The policy emphasizes identifying important resources and assuring their protection through means other than direct Federal acquisition. The policy provides general direction on what type of areas will be studied, how priorities

will be established, and what alternative protection techniques will be considered. It also addresses schedules for implementing adopted protection strategies in newly authorized areas.

The policies and planning procedures adopted by the LPG will help meet the recreation and conservation challenges of the 1980's. In the past the Federal acquisition program generally emphasized large relatively pristine areas with outstanding natural values. Looking to the future, more attention will be directed to areas closer to population concentrations. Many of the areas currently under consideration possess a variety of natural, cultural, and recreational resources on land with important economic values. For these complex landscapes, direct Federal land acquisition and management may be inappropriate as well as financially impractical.

The Area of National Concern (ANC) concept is one new approach to combining a variety of alternatives to fee-simple acquisition in an effort to protect natural resources and provide recreational opportunities. Greenline Parks, Preserves, Reserves, the "Cape Cod Formula", and other terms have been used previously to describe variations on the ANC concept. Although titles vary, the basic idea is to build a partnership where the Federal government provides a limited amount of financial and technical assistance to support State and local leadership in planning and managing an area of importance to the nation as a whole. Within the boundaries of the ANC some land would be acquired by Federal or State agencies but most of the area would be protected by a combination of zoning, easements, regulatory authorities, and other alternatives to fee simple purchase. Private ownership and compatible economic activities such as farming would continue. Grant programs, purchase lease-back or sell-back arrangements, and other incentives could encourage current residents to provide tourist facilities and other recreational services.

Several existing national areas incorporate some elements of the ANC concept. For example, the Sawtooth and Whiskytown-Shasta-Trinity NRA's have used easements and zoning to reduce the need for outright purchase. The Wild and Scenic River System emphasizes limited purchase of access points and reliance on easements or zoning along the shoreline to protect the most important recreational values of the river. Cape Cod, Fire Island, and Sleeping Bear Dunes provide additional examples of national areas with continued private ownership subject to zoning protection. At the State level, New York's Adirondack Park provides one model of how public and private ownership can be managed within a single boundary.

The most complete example of the ANC concept at work is now unfolding in the New Jersey Pinelands. In 1978 Congress authorized the Pinelands National Reserve encompassing one million acres in the Northeast's most industrialized state. The Pinelands offer a unique combination of fascinating plants, important wildlife habitats, valuable supplies of pure water, numerous recreational opportunities, and a significant local economy based largely on compatible agricultural uses.

The Pinelands ecosystem is being threatened by encroaching residential development fueled in part by growth around Atlantic City. The protection strategy calls for a comprehensive management plan to be developed by a 15 member commission including Federal, State and local representation.

The Plan must be completed within 18 months and forwarded to the Secreatry of the Interior for approval. While the plan is being developed the Act provides for "emergency" acquisition of lands with critical ecological values which are in immediate danger of being destroyed. Once the plan is approved, the Act authorizes grants for land acquisition by the State. However, the plan must require that State and local police powers be used to the maximum extent practicable to regulate the use of land and water resources. Only $23 million of Federal money is authorized for land acquisition in the 1 million acres, supporting the point that State and local regulations will be the most important implementing tools.

The ANC approach cannot replace the Federal land acquisition program, but it can provide a workable alternative in many new areas proposed for study. Lowell, Massachusetts, the Santa Monica Mountains in California, and Jean Lafitte in Louisiana are the most recent examples of the ANC concept already being applied around a core of land to be managed as a national park, recreational area, or historical preserve.

In the years ahead, we can expect more ANC's to be established where private ownership and public interests in natural, cultural and recreational values can be managed effectively without exclusive reliance on Federal acquisition. HCRS and other members of the LPG will be continuing to support this trend toward finding more creative solutions to conservation and recreation challenges.

107

SOCIAL-PSYCHOLOGICAL IMPLICATIONS FOR RECREATION RESOURCE PLANNING[1]

Hardeep S. Bhullar
Chairman and Associate Professor
Department of Recreation and Park Administration
University of Missouri-Columbia

Alan R. Everson
Associate Professor
School of Forest Resources
University of Missouri-Columbia

Scout L. Gunn
Associate Professor
Department of Health, Physical Education and Recreation
Oklahoma State University, Stillwater

INTRODUCTION

Many claims have been made concerning the cause/effect relationship between recreation and leisure activity, and the acquisition of quality living. Studies have investigated the utility, quality, and quantity of recreation facilities. Studies of programs, leadership, members, and general classifications of users have also been conducted.

If leisure participation is need-fulfilling behavior that is learned, motivated by and predicated upon the individual's personality, then we need to study the relationships between this behavior and the needs fulfilled by it. Works of several individuals show that trends are developing in attempt to further understand recreative behaviors of the participant populations. Researchers such as Hendee, Driver, Brown, Moss and Gray are beginning to explore user traits and activity relatedness.

This paper is a presentation of results, and discussions, of three studies conducted to explore possible relationships between participation in selected outdoor leisure activities and fifteen personality variables in volunteer subjects. Specially designed Outdoor Recreation Activity Questionaires were used to measure the rates of participation. The Edwards Personal Preference Schedule and the Adjective Check List were used to measure personality variables.

The three studies were conducted with subjects from the Appalachian State University in North Carolina, the University of Georgia, and Mississippi State University. The studies in Georgia and Mississippi included white and black, male and female college students. These studies offer three separate opportunities to examine the effect of clustering outdoor recreation activities, and the clustering of personality traits based on the characteristics of respondents. The studies show several similarities in the needs that are being met by activities. There are also similarities in the order of activity clusters and need clusters, but different techniques were employed and the studies' results are not fully comparable.

METHODS

The study involving subjects from North Carolina used the Adjective Check List (ACL) to measure the personality traits and the Outdoor Recreation Participation Questionnaire

[1]For presentation at the Outdoor Recreation Trends Symposium New England Center, Durham, New Hampshire, April 1980.

(QRPQ) to measure outdoor leisure participation. Volunteer subjects for the studies in Mississippi and Georgia were administered similar instruments -- the Edwards Personal Preference Schedule (EPPS) and the Outdoor Recreation Activity Questionnaire (QRAQ). In all cases, participation rates and the needs were "factor analyzed" to obtain clusters of outdoor recreation activities and personality traits; this procedure clusters entities according to their similarities. A matrix of interpersonal similarity coefficients is computed by the program, and this matrix is "searched" for patterns of similarities (Cattell, 1966).

For the Mississippi and North Carolina studies, Canonical Correlatinal Analysis was used to determine if a relationship existed between the two variable sets - activity clusters and trait clusters. This procedure provided an indicator of the maximum relationship that existed between the two variable sets, and also calculated the relative contribution of each variable to the relationship.

RESULTS AND DISCUSSION

A. Clusters

It is postulated that there is a measurable interrelationship between motives or need-states and leisure activities. It is suggested that a particular activity may be related to several needs, but is more likely to serve similar needs for similar people. Also several activities may be related to the same or similar needs of leisure resource users.

Activity clusters formed by Factor Analysis seemingly have much face validity, and they are correlated statistically. For example, in white males of the Georgia study (Table 1), Cluster 1 involves three walking activities -- hiking, nature walks, and walking for pleasure. Cluster 3 is water based -- boating, water skiing and sunbathing. Cluster 5 is composed of the typical "sportsman's" activities -- camping, fishing, hunting, target shooting and archery. Similarly, activity cluster results are reported for black males and white females (Table 2,3,4).

The North Carolina activity data divides into seven activity clusters (A1-A7) in table 5. Activity cluster one (A1) includes the following activities: sightseeing, walking for pleasure, attending outdoor social functions, automobile riding for pleasure, jogging, picnicking, and nature walks. A1 is referred to as the "Nature-Pleasure" cluster. Cluster A2 is comprised of the following activities: horseshoes, golf, touch football, softball or baseball, basketball, miniature golf, attending

TABLE 1

Activity and Need Relationship for White Males (Georgia)

Activity Cluster	Activities	Need Cluster	Needs
1	Hiking Nature walks Walking for pleasure	1	(-) Order (+) Affiliation (+) Nurturance
2	Picnics Horseback riding Tennis Bicycling Sightseeing	2	(+) Intraception
3	Boating Skiing (water) Sunbathing	3	(-) Dominance (+) Abasement (-) Heterosexuality
4	Canoeing Skiing (snow) Cave exploring Mountain Climbing	4	(-) Achievement (-) Exhibition
5	Camping Fishing Hunting Target shooting Archery	5	(-) Succorance (+) Dominance (+) Change
6	Automobile riding	6	(-) Deference (+) Autonomy

TABLE 2

Activity Cluster and Need Cluster Relationship (Mississippi)

Activity Cluster	Activities	Need Cluster	Needs
1	Boating, large reservoirs Horseback riding Swimming, lakes Motorbike, street Fishing, large reservoirs	1	(+) Affiliation (+) Nurturance (-) Aggression
2	Fishing, rivers Canoeing, rivers Hunting, small game Hunting, bird	2	(+) Achievement (+) Dominance (-) Succorance
3	Hiking Nature walks Walking for pleasure Sightseeing	3	(+) Heterosexuality (-) Abasement
4	Camping, trailer Canoeing, lakes & large reservoirs	4	(+) Order (-) Change
5	Fishing, lakes Boating, rivers Mountain climbing Sightseeing	5	(-) Nurturance (+) Intraception (+) Dominance

TABLE 3

Activity Cluster and Need Cluster Relationship (Mississippi)

White Females

Activity Cluster	Activities	Need Cluster	Needs
	Swimming, rivers		
	Sailing	1	(+) Exhibition
	Scuba, sea		(-) Intraception
	Boating, large reservoirs		(+) Order
2	Motorbike, street	2	(+) Aggression
	Canoeing, large reservoir		(-) Affiliation
	Canoeing, rivers		
	Hunting, bow & arrow		(+) Exhibition
3	Snow skiing	3	(-) Intraception
	Scuba, lakes & reservoirs		
	Camping, trailer		(+) Dominance
4	Bicycling	4	(-) Abasement
	Touch football		
	Nature walks		(+) Succorance
5	Walking for pleasure	5	(-) Change
	Sightseeing		(-) Autonomy

TABLE 4

Activity and Need Relationship for White Females (Georgia)

Activity Cluster	Activities	Need Cluster	Needs
	Horseback riding		(+) Order
	Attending outdoor sports		(-) Affiliation
1	Attending outdoor concerts, drama	1	(-) Nurturance
			(+) Endurance
	Hiking		(+) Autonomy
2	Nature walks	2	(+) Change
	Walking for pleasure		
	Boating		(+) Deference
	Skiing (water)		(-) Autonomy
3	Sunbathing	3	(-) Aggression
	Automobile riding		
	Picnics		(-) Achievement
4	Swimming	4	(-) Succorance
	Sightseeing		(-) Dominance
			(+) Abasement
	Skiing (snow)		(-) Exhibition
5	Golf	5	(+) Intraception
	Target shooting		(-) Heterosexuality

TABLE 5

Activity Clusters: Content and Identification

Cluster Number	Activity	Identification Factor
	Sightseeing	
	Walking for pleasure	
	Attending outdoor socials	
A1	Automobile riding for pleasure	Nature-Pleasure
	Jogging	
	Picnicing	
	Nature walks	
	Horseshoes	
	Golf	
	Touch football	
A2	Softball or baseball	Social Sports
	Basketball	
	Miniature golf	
	Attending outdoor sporting events	
	Tennis	
	Fishing	
A3	Hunting (small game)	Predator Sports
	Target Shooting	
	Primitive camping	
A4	Hiking (with packs)	Nature/Conqueror-Horses
	Horseback riding	
	Bicycling	
A5	Motorbike riding	Bike-Concerts
	Attending outdoor concerts, drama	
	Swimming (lake, river ocean)	
	Swimming (pool)	Water-Orientation
A6	Motorboating	
	Water skiing	
	Sunbathing	
A7	Sledding or Tobogganing	Winter Sports
	Snow skiing	

outdoor sporting events, and tennis; this cluster is primarily oriented toward "Social Sports". A3 is made up of fishing, hunting (small game), and target shooting, which is identified as "Predator Sports". Primitive camping, hiking (with packs), and horseback riding comprise the fourth activity cluster, A4. This cluster is referred to as "Nature/conqueror-Horses". Bicycling, motorbike riding, and attending outdoor concerts (drama) make up the fifth activity cluster, A5, which is identified by the key words "Bike-Concerts". A6 identifies "water-oriented" activities, and includes: swimming (lake, river, ocean), swimming (pool), motor boating, water skiing, and sunbathing. Sledding or tobogganing, and snow skiing, form the last activity cluster, A7, representing "Winter Sports".

Three clusters (T1-T3) were obtained for the fifteen personality traits (Table 6). T1 contains (+) achievement, (+) dominance, (+) endurance, (+) order, (+) intraception, (-) succorance, and (-) abasement. This cluster is discussed as the "Leadership-Organization" factor. Trait cluster T2 is made up of the following traits: (-) exhibition, (-) autonomy, (-) aggression, (+) abase-

110 BEST COPY AVAILABLE

ment, (+) deference, and (-) dominance. This cluster is referred to as the "Subordination-Guilt" factor. (+) Nurturance, (+) affiliation, (+) heterosexuality, and (+) change comprise the third trait cluster, T3, and is identified as the "Socialization-Change" factor.

Results of the study on black males and females show that their needs are only a little different from those of white subjects; these differences are accounted for by such factors as culture, opportunities to participate, availability of facilities and the location of residence. With the current trends toward narrowing social and cultural gaps between various ethnic and cultural groups, it is becoming imperative that leisure facilities be planned while taking into consideration all of these groups.

TABLE 6

Trait Clusters: Content and Identification

Cluster Number	Traits	(+ or -)	Identification Factor
	Achievement	(+)	
	Dominance	(+)	
	Endurance	(+)	
T1	Order	(+)	Leadership-Organization
	Intraception	(+)	
	Succorance	(-)	
	Abasement	(-)	
	Exhibition	(-)	
	Autonomy	(-)	
	Aggression	(-)	
T2	Abasement	(+)	Subordination-Guilt
	Deference	(+)	
	Dominance	(-)	
	Nuturance	(+)	
	Affiliation	(+)	
T3	Heterosexuality	(+)	Socialization-Change
	Change	(+)	

Results of these studies indicate that blacks do participate in activities which were traditionally considered for whites only.

B. Correlations

For the North Carolina data a Canonical Correlation Analysis was made, in addition to clustering, to determine if a relationship existed between the two variable sets -- activitiy clusters and trait cluster. Analysis shows all of the activity clusters except one (A4) to be significantly correlated with the set of trait variables at the .01 level. These correlations are the major contribution of this paper to outdoor recreation trend researchers.

A1 Nature-Pleasure. The "Nature-Pleasure" oriented activities (A1) are most participated in by individuals scoring high in the "Socialization-Change" cluster (T3). These activities are enjoyed by both sexes. The point is that the desire for social contact within an outdoor setting seems to be the primary motivation for activity, rather than participation in an object-oriented skill. Lack of structure and competitiveness characterizes both the activities and the users. Lack of participation on the part of individuals scoring high in T2 is somewhat surprising, in that activities such as sighseeing, walking for pleasure, and nature walks can be isolated experiences. Perhaps the crowding effect of users upon resources has paid its toll on the participation level of introverted users. Then again, perhaps the "Subordination-Guilt" oriented individual has never been a participator.

A2 Social Sports. Participants in "Social Sports" (A2) demonstrate the same trait orientation as participants in A1. Competition is more of a factor in A2, but the socializing characteristic is still evident. Once again, introverted individuals do not participate in social sports. The lack of any correlation with extroverted individuals suggests that participation by these individuals is neither significantly present nor absent. The popularity of activities enjoyed by both sexes is of growing importance. Perhaps the current drive for "equality" is evident in the correlation of these activities and the related needs.

A3 Predator Sports. The more dominant and aggressive traits evidenced in T1 were significantly correlated to A3. This supports Moss' contention that hunters and fishermen are more traditional, dogmatic, and rigid. The "predator-prey" or "lording over" motivation is apparent in this correlation. Quite naturally, then, the negative effect of T2 and A3 is evident. Perhaps it can be concluded that these more rigid individuals do not appreciate the intrusion of other people.

A4 Nature Conqueror/Horses. The relationship between A4 and the set of trait variables was not significant at the .01 level, but in the step-wise analysis it was noted that "Subordination-Guilt" oriented individuals tended not to participate in primitive camping, hiking (with packs), and horseback riding.

A5 Bike/Concerts. Specific personality traits positively correlated with A5 were not obvious, though a negative correlation with T2 was reported. It was thus assumed that the introverted "Subordination-Guilt" oriented persons did not participate in faddish activi-

ties such as bicycling, motor bike riding, and outdoor concerts (perhaps "Rock Festivals"). The lack of a specific, positive identity of individuals participating in these activities may be due to the faddishness of the activities.

A6 Water Oriented. Water oriented activities were most participated in by those scoring high in T3 and least participated in by those scoring high in T2. Once again it becomes apparent that the introverted "Subordination-Guilt" oriented individual is not active in outdoor activities. The question of reaching these individuals is pertinent to recreology. Participation in water activities (other than fishing) seemed to be mostly inspired by the social contact involved rather than the goal of individual accomplishment. Most certainly, competition in water activities is important, but to the leisure resource planner it is not a dominant factor.

A7 Winter Sports. The correlation of all trait clusters to winter sports indicates that these activities are somehow both competitive and socializing in nature. Perhaps more detailed study concentrated on outdoor winter activities would yield a more precise measurement of activity-trait correlations.

Overview, A1-A7. An overall view of the relationship of personality traits or needs to outdoor leisure activities seemed to indicate a strong socializing motivation in most activities. Introverted personalities have little opportunity for involvement. It is becoming increasingly likely that aggressive, goal-oriented, dogmatic individuals are being crowded in their participation and forced to compromise in their activity.

IMPLICATIONS

Perhaps by now some of the practical implications of this type of research are apparent. Personality traits and activity clusters are the real units of measure of outdoor recreation. If we are to be successful in providing the best possible outdoor recreation experiences to the public, we must understand (1) which activities are similar and dissimilar, and (2) what users are actually getting out of their recreation. It is not enough to simply offer "picnicking" and count the users.

How do we use the information? Perhaps we will conclude that several related activities should be offered at the same recreation area -- cater to a given kind of user. Results suggest that some activities -- actually users -- need to be insulated from others; it is likely that where dissimilar activities are juxtaposed, a lessened recreation experience occurs by a sort of conflict which has not been apparent. Alternately, perhaps we will want to be dollar efficient, and not offer duplicative activities. Or perhaps we should spread like activities at several locations to give users a variety of settings from which to chose for recreation. Maybe we can save money by providing an activity that costs less but meets the desired need.

Once we know what "rewards" people are seeking, managers can not only respond to current users but also to persons who are not currently recreating because what they need is not available. Planners can devise recreation settings and perhaps facilities and activities that deliver desired rewards, i.e. respond to groups with known personality traits. They can devise, emphasize, and perhaps even create improved products.

However, we make no claims at this point about whether people are consistent in what rewards they seek, or whether they seek different experiences at different stages in their life, or even from day to day. Neither do we know the effect of one member in a group on others. Do a group of teenagers exhibit needs that are the average of member's individual needs, or is a range needed at a recreation site? Does a family have a complex set of requirements, and does that set of requirements depend on which members are present, or their age, and so forth? Clearly, there are many things we do not know.

This research offers a "window" to greater understanding. Through it we can learn to respond better to our publics. Through it we can more efficiently plan, acquire, develop and even maintain and operate our outdoor recreation areas. Four problems must be overcome to "enlarge the window". First, more research of this sort needs to be conducted to expand, clarify and confirm findings. Second, we must learn how to apply this new knowledge throughout all aspects of outdoor recreation management. Third, how will this information be disseminated; how will we get recreation management to accept and apply these findings. Fourth, and finally, is there an ethical problem: does broad collection of this kind of information involve invasion of privacy? Beyond that, does it put us in a position of having power over our constituents -- of molding and shaping them to be what the managers or agency or firm wants. Let us hope these problems can be overcome.

TABLE 7

Relationship Between Activity Clusters and Trait Clusters

Activity Clusters		Trait Clusters
A1 Nature-Pleasure		T3 Socialization-Change
A2 Social Sports		T3 Socialization-Change
A3 Predator Sports		T1 Leadership-Organization
A4 Nature-Conqueror-Horses	(-)	T2 Subordination-Guilt
A5 Bike-Concerts	(-)	T2 Subordination-Guilt
A6 Water-Orientation		T2 Subordination-Guilt
A7 Winter Sports		T1 Leadership-Organization T2 Subordination-Guilt T3 Socialization-Change

REFERENCES

Bhullar, H.S., 1970. Personality and Outdoor Recreation: A study of outdoor recreation as need fulfilling behavior in Whites and Blacks, Unpublished Ph.D. dissertation, University of Georgia.

Cattell, R.B., 1966. The Taxonomic Recognition of Types and Functional Emergents, Handbook of Multi-variate Experimental Psychology, Chicago: Rand McNally and Company.

Driver, B.L., and Brown, P.J., 1975. A socio-pyschological definition of recreation demand, with implications for recreation resource planning. Appendix A. In Assessing Demand for Outdoor Recreation Washington, D.C.: National Academy of Science. Reprinted by the Bureau of Outdoor Recreation, USDI.

Edwards, A.L., 1959. Edwards Personal Preference Schedule Manual, New York: Psychological Corporation.

Everson, A.R., 1978. Standards in State Comprehensive Outdoor Recreation Planning: A Methodological Study, Unpublished Ph.D. dissertation, Texas A&M.

Gunn, S.L., 1972. A comparative study of selected personality traits in college students and their participation in selected outdoor recreational activities, Unpublished Ph.D. dissertation, University of Georgia.

Gray, D.E., 1980. What is this thing called recreation? Parks and Recreation, Vol. 15, No. 3.

Hendee, J.C., 1971. Sociology and applied leisure research. Pacific Sociological Review, Vol. 14, No. 3, 306-68.

Moss, W.T., and Lamphear, S.C., 1970. Substitutability of recreational activities in meeting stated needs and drives of the visitor. Environmental Education, Vol. 1, No. 4, 129-31.

AUTOMATIC, TIME-INTERVAL TRAFFIC COUNTS FOR RECREATION AREA MANAGEMENT PLANNING[1]

D. L. Erickson, Assistant Professor
Department of Forestry
University of Kentucky
Lexington, KY

C. J. Liu, Assistant Professor
Department of Forestry
University of Kentucky
Lexington, KY

H. K. Cordell, Project Leader
Forest Recreation Research
Southeastern Forest Experiment Station
U.S. Forest Service
Athens, GA

Abstract.--Automatic, time-interval recorders were used to count directional vehicular traffic on a multiple entry/exit road network in the Red River Gorge Geological Area, Daniel Boone National Forest. Hourly counts of entering and exiting traffic differed according to recorder location, but an aggregated distribution showed a delayed peak in exiting traffic thought to be typical of recreation areas. The proportions of hourly entering and exiting traffic and weekend and weekday traffic varied among locations. An exceptionally high weekend use was related to occurrence of the autumn color season. Subsequently, there was a general down-trend in weekend use. Implications of traffic data for the allocation of resources to information, interpretation, and enforcement programs in the Red River Gorge area are discussed.

INTRODUCTION

Traffic counts have been used as an indicator variable for recreation use estimation on forest lands and developed recreation sites (James 1971). With few exceptions, axle counts, as opposed to vehicle counts, have been used as the indicator variable in regression models. Typically, recorders are placed on two-way, single-entry roads leading to developed or dispersed recreation areas. Usually, traffic recorders must be hand-read at selected time intervals by field personnel. This paper reports the use of dual-input, time-interval recorders to record hourly and daily variations in traffic flow in forest areas with multiple entry/exit points. These recorders were used in a recreation use estimation study on the Red River Gorge Geological Area on the Daniel Boone National Forest.

Data on time variation in traffic counts have implications for the development of recreation area management plans. Recreation

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

planning can be viewed as a production process where management and site resources and human use are managed to produce recreation experiences and ultimately, human benefits (Driver and Brown 1975). It is important to know the total amount and the hourly and daily patterns of recreation use because of their impact on recreation experiences, the resource base, and management loading. Heavy amounts of recreation use can cause displacement of dissatisfied users in both time and space. It can also increase the probability of traffic accidents, forest fires, user conficts, and unacceptable public behavior, as well as resource impacts such as trail and campground deterioration. Information about the distribution of recreation use is important for assigning of personnel and other management resources to road and trail patrols, interpretive activities, maintenance work loads, requests for traffic control, and justification for requests for personnel overtime. All of these are management activities which can contribute directly to enhancing recreational experiences.

METHODS

In the summer of 1979, a recreation use study was inititated in the Red River Gorge Geological Area. The Gorge is a 25,750 acre area located in the Stanton District of the Daniel Boone National Forest. Dual-input traffic recorders were located at six locations along roads near the Gorge boundary (Fig. 1). These locations are Pine Ridge, Koomer Ridge, Tunnel Ridge Road, Nada Tunnel, Road 23, and CCC Camp. At each site, inductive loops were installed to record directional traffic, and recorders were set to print and punch traffic counts at 15-minute intervals during the 4-month study period, August 1 to December 2, 1979. Data were punched onto 8-channel paper tape and translated to computer cards. Data were aggregated into hourly and daily counts and plotted.

RESULTS

Although recorders were installed at six locations, the traffic data for two locations--Koomer Ridge and Tunnel Ridge--were excluded from data analysis. These recorders were located on single-entry roads where vehicles entered and exited the same point. These data have no effect on the total traffic load of the multiple entry/exit road network.

Graphs of the number of vehicles plotted in relation to hour of the day provide information on hourly patterns of vehicular traffic at specific locations in the Gorge area. Pine ridge, located near the Mountain Parkway, appears to be more important as an exit point for vehicular travel (Figure 2). More vehicles are exiting than entering at this point. There are approximately equal amounts of traffic entering and exiting this point until about 2 p.m. when exiting traffic begins to exceed entering traffic. Exiting traffic peaks at 4 p.m. Also characteristic of this point is the high volume of exiting traffic occurring in a narrow time span and a lower volume of entering traffic in a wider time span.

In contrast to Pine Ridge, Nada Tunnel has more entering than exiting traffic (Figure 3). The curve of the entering traffic reaches its summit at 4 p.m. and then declines rapidly. Compared with this curve, the exiting traffic curve climbs at a slower rate. It reaches the highest point about 4 p.m. and then follows a gentle decline until 6 p.m. Thereafter, the curve drops rapidly similar to the entering traffic curve. We suspect that most of the vehicles that depart between 2 and 8 p.m. are day users of the Gorge area.

In comparison with Pine Ridge and Nada Tunnel, CCC Camp has a different traffic pattern. There are about equal amounts of entering and exiting traffic at all hours of the day (Figure 4). These curves depict traffic patterns revealing heavy local use.

To obtain an understanding of hourly traffic for the entire gorge area, data were aggregated for Pine Ridge, Nada Tunnel, CCC Camp, and Road 23 and then plotted (Figure 5). There is a more rapid increase in the entering than exiting traffic until about 2 p.m. At that time, the rate of exiting traffic begins to accelerate. Note, again, the delay in the peaking of exiting in relation to entering traffic. While we recognize that some residential traffic is included in this plot, we believe that it is typical for a multiple entry/exit forest area such as the Red River Gorge area.

Figure 6 shows the entering traffic for Pine Ridge and CCC Camp throughout the study period. At Pine Ridge, there was a great deal of difference between weekends and weekdays which suggests heavier recreational traffic entering this point in comparison to local residential traffic. CCC Camp, on the other hand, does not show much variation in weekday to weekend traffic suggesting proportionately more residential/commercial traffic.

Figure 7 shows the incoming and exiting traffic for the aggregate of Pine Ridge, Nada Tunnel, Road 23, and CCC Camp. Note the differences between weekend and weekday traffic. Weekend traffic is much heavier than weekday traffic which is not surprising. Many studies have reported such variations in traffic patterns at recreation use areas--and researchers

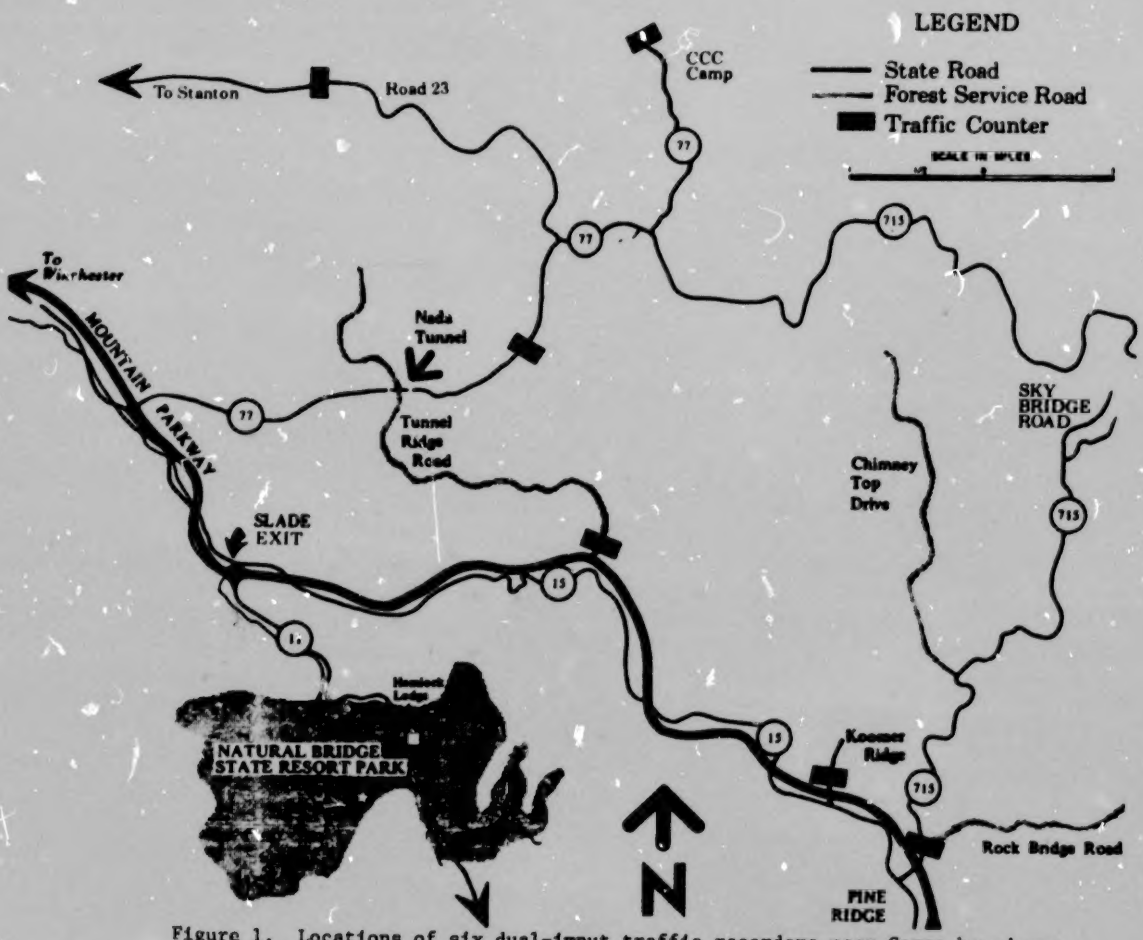


Figure 1. Locations of six dual-input traffic recorders near Gorge boundary.

have used these data to stratify the sample in recreation use studies.

Note also that some of the weekend days have considerably larger volumes of traffic. The highest one is a weekend of peak fall color. Another weekend is a holiday, labor day weekend. In Figure 7, there appears to be a downward trend in traffic after the peak fall color weekend. Although there is some variation from weekend to weekend, this variation suggests that traffic levels may be related to local weather. Hendee et. al. (1976) reported that low levels of use were associated with adverse weather.

IMPLICATIONS

This study reports daily and hourly fluctuations in traffic counts in the Red River Gorge area. To make suggestions about the implications for recreation management planning requires three assumptions. First, there are small variations in the proportion of recreational traffic within weekend and weekday strata. To the extent that there is variation, traffic patterns will not be valid indicators of volumes of recreational traffic in the Gorge area. A second assumption is that that proportion of recreation traffic does not vary significantly at each traffic counter location over a short period of time. A third assumption is that accurate directional traffic counts can be made. Our calculations show a traffic count error of 3 percent per site per day. We believe that the major cause of this counting error was not a malfunction of traffic recorders, but rather a double count, one for each direction, resulting from vehicles traveling down the center of the road. A procedure for eliminating directional traffic counting error has been developed (Erickson, in press).

The data presented above have a number of

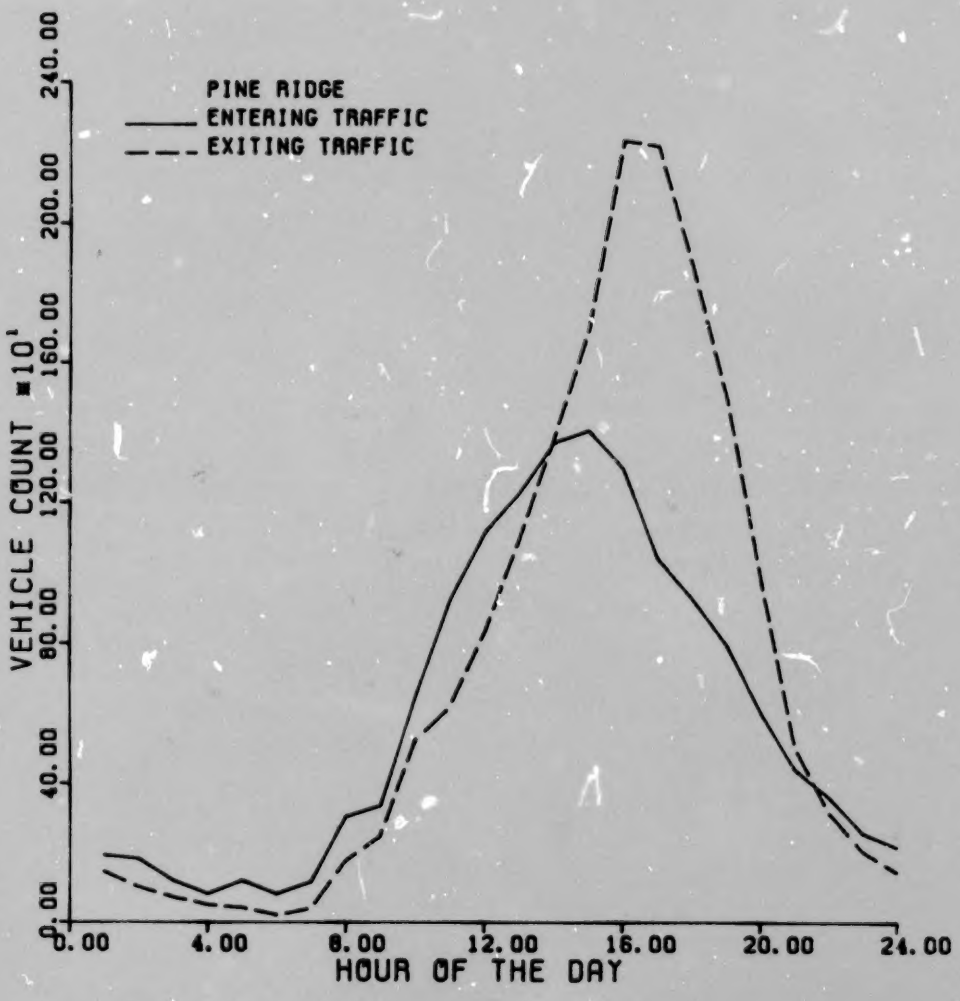


Figure 2.--Hourly entering and exiting vehicular traffic between August 1 and December 2, 1979 at Pine Ridge.

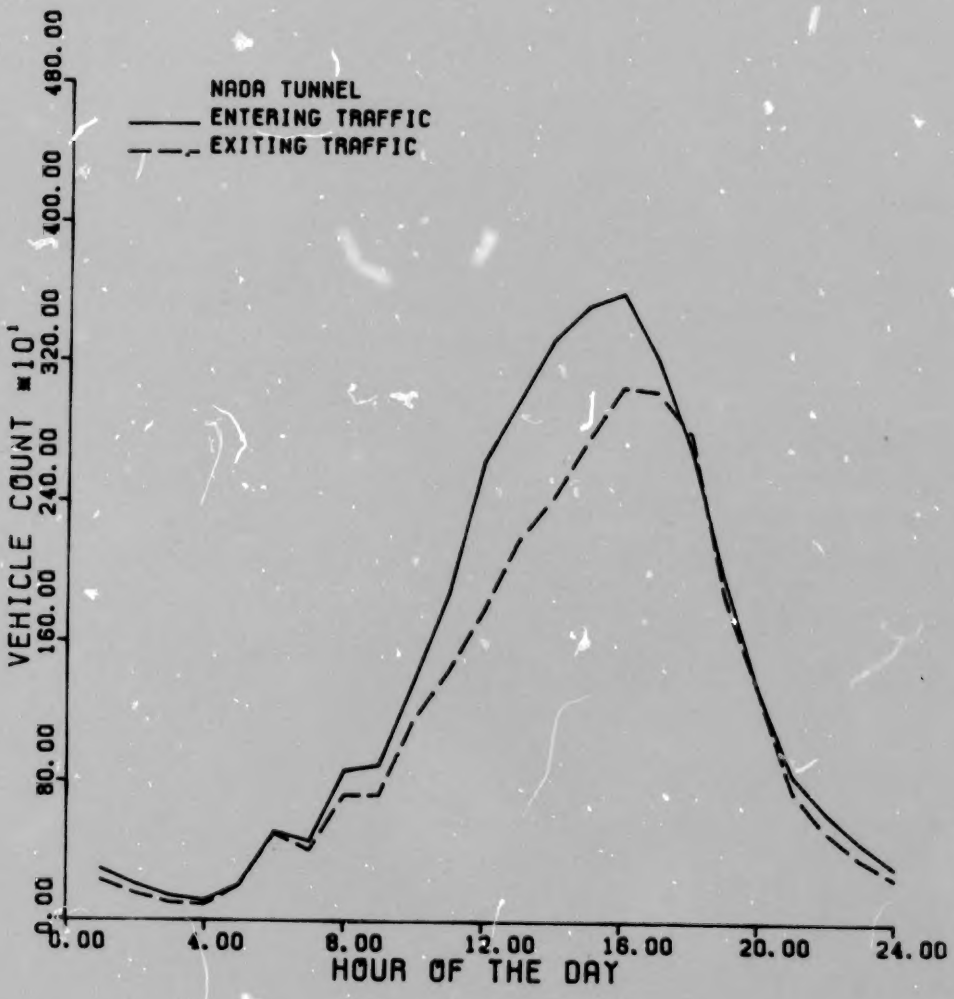


Figure 3.---Hourly entering and exiting vehicular traffic between August 1 and December 2, 1979 at Nada Tunnel.

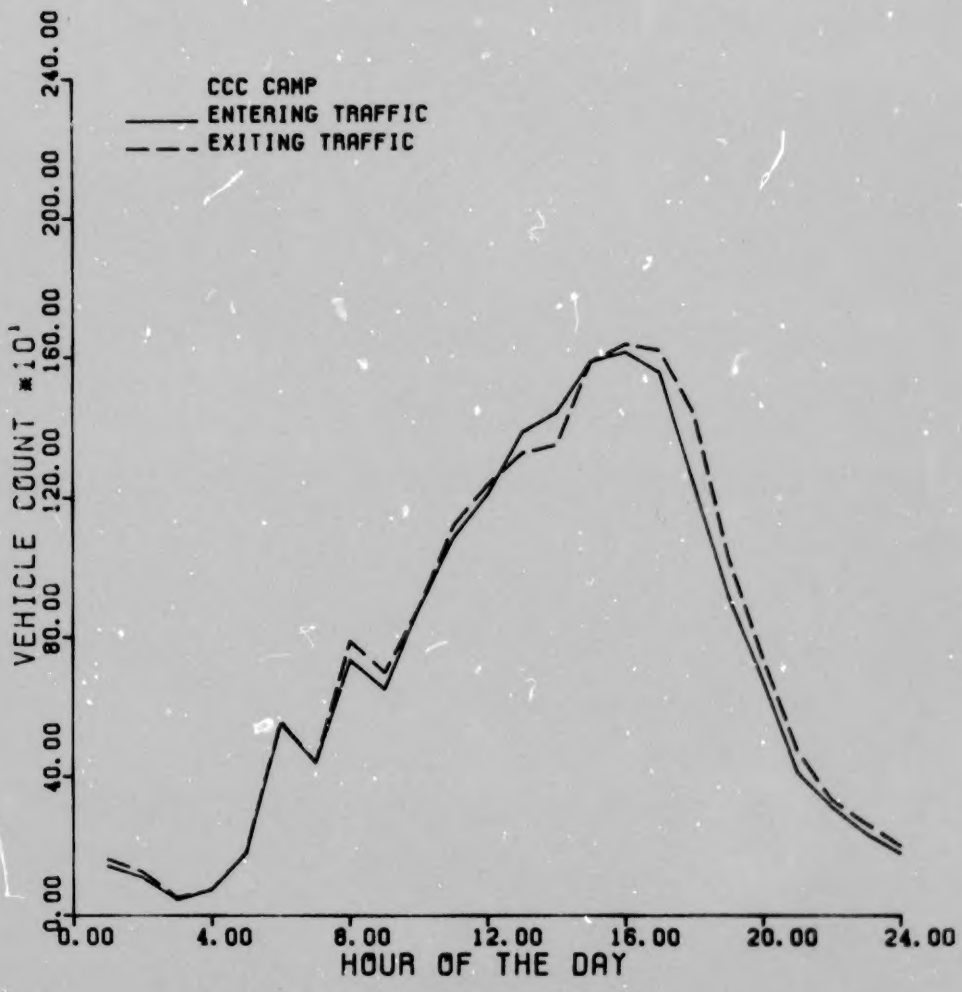


Figure 4.--Hourly entering and exiting vehicular traffic between August 1 and December 2, 1979 at CCC Camp.

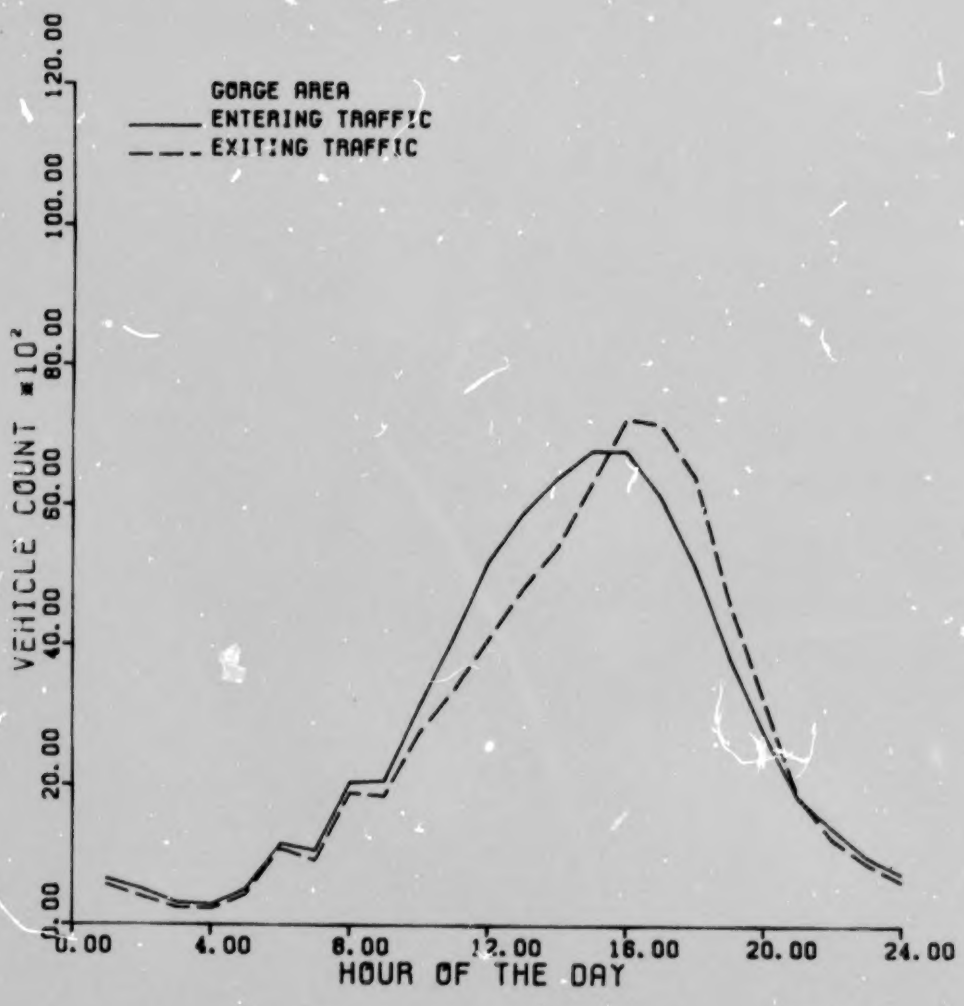


Figure 5.--Aggregated hourly entering and exiting vehicular traffic between August 1 and December 2, 1979 for four locations in the Red River Gorge Area.

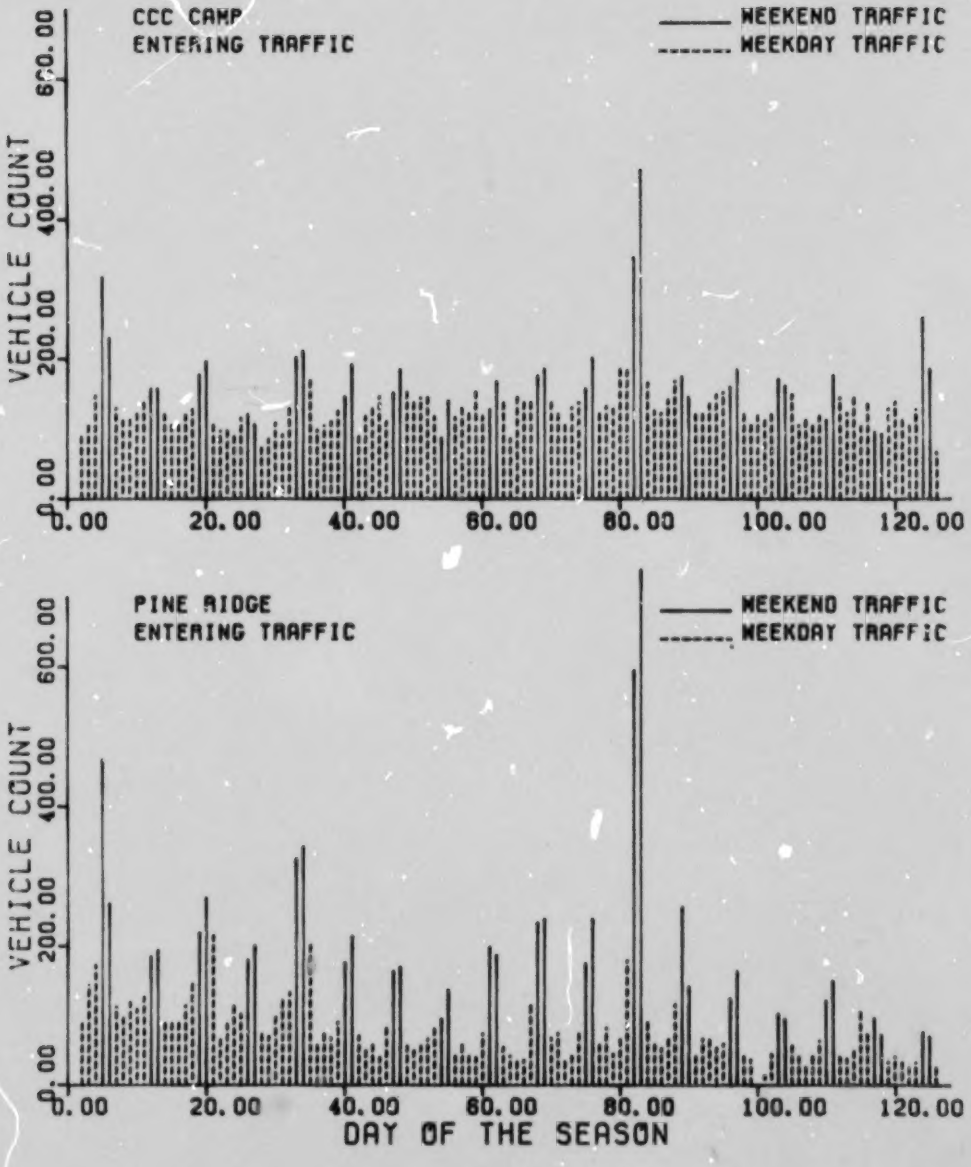


Figure 6.--Daily distribution of entering vehicular traffic between August 1 and December 2, 1979 at two Red River Gorge entry points.

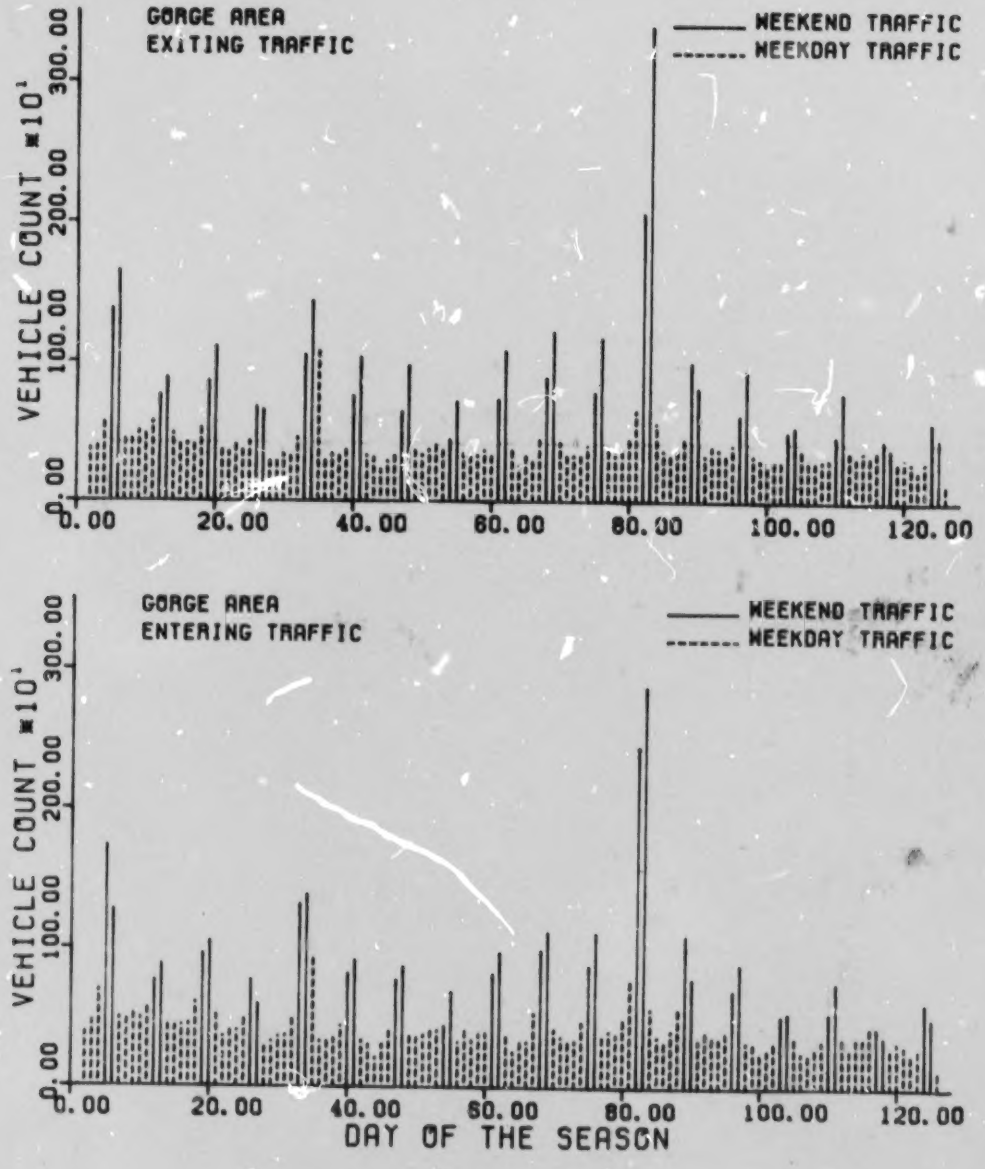


Figure 7.--Aggregated daily entering and exiting vehicular traffic between August 1 and December 2, 1979, for four locations in the Red River Gorge Area.

implications for recreation management planning. Our data suggest that certain roads are used more heavily as entry points into the Gorge area, e.g., Nada Tunnel, while others are used more heavily as exit points, e.g., Pine Ridge. Based on comments received during the study period, people are not knowledgeable about the kinds of recreational opportunities in the Gorge area, and are not informed about the geological significance of it. Given the heavier entering traffic at Nada Tunnel, it would be effective to locate information/interpretive media at this location. On weekends, it may be desirable to locate staff to both control traffic at the Tunnel and to hand out a brochure for a self-guided auto tour (Sharpe, 1976) or for stimulating use dispersal away from crowded sites. Nada Tunnel is a single vehicle passage through the mountain. As a result, traffic is slowed down considerably, particularly on weekends.

Pine Ridge had more exiting than entering traffic. At this point, it may be appropriate to locate a departure sign. In addition, it also might be desirable to locate a deposit box where people could place their suggestions for improving the area.

The greatest need for road or trail patrols would appear to be from 10 a.m. to 4 p.m. since most of the traffic is either entering or exiting from the Gorge area. After 4 p.m., entering and exiting traffic decreases at a rapid rate. This would appear to be an appropriate time to contact campers to see if they have problems. This might also be an appropriate time to conduct an interpretive program.

Many of the vandalistic acts that occur in forest areas occur at night, and traffic counts may be an indicator of these acts--even recorders are subject to tampering. Examination of traffic records for days and nights when vandalism has occurred may help identify most likely times of occurrence and from where those committing the vandalistic acts may have entered the system.

From a management planning standpoint, it is necessary to have a firm rationale for allocating management personnel and other resources. Obviously traffic in the Gorge area is higher on weekends, suggesting that more personnel should be allocated to these days. But among weekends, use is highly variable and the specific number of personnel needed must be decided on the basis of expected visitor load. An examination of vehicular loading for one year should be useful for determining personnel needs for specific weekends and other periods for several succeeding years. For weekends that are known to have high use levels, such as holidays or weekends at the peak of the fall color season, additional temporary personnel might be hired or reassigned to assist in visitor management including interpretation and enforcement.

Traffic counts such as recorded during 1979 for the Red River Gorge Area should have use for area management planning for a few years after the study period. Perhaps equally important, however, are insights that might be gained by 3- to 4-year repeat measures of traffic periodicity and patterns. Noticeable changes in either hourly or daily pattern of use could indicate evolving changes in these patterns or in the type of users. Forest recreation management is greatly in need of such indicators of change so that evolution of use patterns can be detected rapidly.

In summary, hourly, daily and seasonal traffic flow records seem to be useful management and program scheduling tools. There is much we do not know about interpreting traffic flows, but further research and management application should teach us a great deal.

LITERATURE CITED

Driver, B.L. and P.J. Brown. 1975. A social-psychological definition of recreation demand, with implications for recreation resource planning. pp. 64-88. IN Assessing demand for outdoor recreation. National Academy of Sciences, Washington, D.C. 123 p.

Erickson, D.L. In Press. Use of traffic recorders in dispersed recreation use estimation. Southeastern Forest Experiment Station, U.S. Forest Service, Asheville, N.C.

Hendee, J.C., M.L. Hogans, and R.W. Koch. 1976. Dispersed recreation on three road systems in Washington and Oregon: First year data. USDA Forest Service Research Note PNW-280, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. 21 p.

James, G.A. 1971. Inventorying recreation use, pp. 78-95. IN Recreation symposium proceedings. Northeastern Forest Experiment Station, U.S. Forest Service, Upper Darby, Pa. 211 p.

Sharpe, G.W. 1976. Interpreting the environment. John Wiley & Sons., New York. 566 p.

CROSS-COUNTRY SKIING TREND DATA: PLANNING FOR PARTICIPANT NEEDS[1]

Floyd L. Newby
Associate Professor
School of Forest Resources
University of Maine
Orono, ME

William D. Lilley
Extension Safety Specialist
School of Forest Resources
University of Maine
Orono, ME

As societal and economic pressures mold and alter patterns of human behavior, the outdoor recreation planner gazes into the milange of "trend data" developed to simplify his planning efforts and .....

Planning without empirical data on which to base sound decisions or solutions is somewhat akin to skydiving with a businessman's umbrella -- things go well until that final moment of truth when responsiveness to need must be evaluated. Planning for cross-country skiing has not enjoyed the security of a strong research base and only recently has there begun to emerge a somewhat accurate picture of the needs being expressed by the participants in this very rapidly growing winter activity. Where are the data coming from and are some data better than others? Do we hang our planner's hats on the economic approaches suggested by Keith (1980), the behavioral tact taken by Driver and Knopf (1977), the "opportunity spectrum" analysis of Ballman (1980), the social/psychological experience attribute studies by Haas, Driver and Brown (1980), or is it possible to simply reach into each process and extract those insights which can improve the planner's ability to eclectically synergize solutions to management problems?

In a recent Michigan study (Stynes 1980), interrelationships between winter recreation activities were explored in order to extract data which could be used in planning and forecasting management and user needs peculiar to winter recreation. Studies such as this can help facilitate a greater use of existing data from multiple sources rather than reinventing the wheel everytime new information is needed. Available data which suggest that people participate in a particular activity in a particular setting or circumstance because they expect to harvest a particular value or realize a particular and predictable recreation experience (Driver and Brown 1980), further suggest an almost mandatory analysis of multiple discipline research concepts as well as data. Such analysis will help bring trend data into focus for application to planning and management problems.

Some of the more promising research being done touches upon the imagery of certain activities and the motivational effects of common and unique images. The data of the USDA, Forest Service (1980) study of "Growth Potential of the Skier Market..." seem to add support to research conducted in the State of Maine over the past few winters. In particular, the concept of "psychological" (equates with the "experience opportunities" proposed by Driver and Tocher 1970, Hendee 1974, and Brown, et.al. 1979) is derived from specific imagery extracted through data analysis of the Maine studies (Newby and Lilley 1978, 1980; Newby and Warner 1980). It is hypothesized that much of the motivation for participation in a particular recreation activity is derived from the "images" held of that activity. This also ties in with the "experience opportunities" concept previously mentioned, but perhaps the more important aspect is that adopting the specific activity image becomes a stronger motivation than the actual participation in the activity. The attempts of the individual to adopt a specific activity image with its predictable behavior should serve as indicators of trends which can aid planners and managers in meeting participant needs.

The process of defining indicators of trends in such outdoor recreation activities as alpine skiing, nordic skiing and snow-

[1] Paper prepared for the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

mobiling involves analyzing participation data and shifts in use patterns over time. Research conducted on these activities across the United States is producing the kinds of data needed to define trends which in turn are useful to planners and managers in both public and private sectors of winter recreation management.

Trend Data For What?

To illustrate the kinds of trend data that might be useful to management, a study of cross-country skiers in Maine was conducted over a three year period. The last winter (1976-77) studied in depth provided some rather detailed data on use, preferences, and behavioral variations among cross-country skiers (a sample of 1042 skiers was obtained by questionnaire). Although only a small part of the data will be presented here, several interesting insights were developed concerning the cross-country skier.

The principal trend data to be addressed will deal first of all with cross-country skier use patterns, followed by some interactions with downhill skiing, and lastly with some trend relationship between the cross-country skier and snowmobiling. This data is presented primarily to show how trend data can be of assistance to management rather than to present it as a methodological analysis. Another methodology study is just too much of a temptation to become totally immersed in what LaPage (1971) once referred to as "research fogweed".

Cross-Country Skiing Use Trends in Maine

One measure of trends in an activity is the extent to which individuals participate or vary participation during the week and from year to year. Looking at Maine skiers we found that during the 1976-1977 cross-country skiing season, 77.4 percent of the questionnaire respondents skied on weekends and they averaged 14.1 days (Median = 12 days) of participation (Table 1). Interestingly, on weekdays, 60.6 percent of the respondents skied and they averaged 21.5 days (median = 15 days) of cross-country skiing (Table 2). These skiers averaged 2.6 hours of skiing on weekdays whereas the weekend skiers averaged 4.2 hours.

TABLE 1: Days of Cross-Country Participation on Weekends (Maximum = 39 days)

Number of Days	Percent of Respondents
1-5	18.0
6-10	31.2
11-15	15.3
16-20	19.0
21-25	5.2
26-30	6.5
>30	4.8
	100.0

TABLE 2: Days of Cross-Country Participation on Weekdays (Maximum = 82 days)

Number of Days	Percent of Respondents
1-5	18.6
6-10	21.2
11-15	13.2
16-20	13.9
21-25	6.0
26-30	6.5
31-35	3.3
36-40	3.2
41-45	1.6
46-50	3.6
51-55	0.5
56-60	3.0
>60	5.4
	100.0

These data suggest that use patterns for cross-country skiing are somewhat different than those of downhill skiing, e.g., cross-country skiing is better distributed throughout the week, therefore, weekend peaking may be less of a problem to management.

Looking at some additional trends might also provide the manager with added insights for planning use and opportunity management. For instance, the changes in the amount of skiing from year to year has signficance and demonstrates some definite trends. Among the cross-country skiers from the sample population who had skied before 1976-1977 (n=641), 55.9 percent said thay skied more in 1976-1977 than previous winters, 30.6 percent said they skied the same amount, and 13.6 percent stated that they skied less (Table 3).

TABLE 3: Number of Days of Participation by Comparison with Previous Use Patterns

Current vs. Previous Use	Median Number of Weekdays	Median Number of Weekend Days
Less	10	10
More	15	15
Same	15	14

Those who now ski more and those who ski the same amount as in previous years are essentially the same whereas, those who ski less do so by about 33% fewer days. Interes-

ingly, those who were skiing less were younger and generally single (Table 4). Questions about future participation showed that more than two-thirds (68.1%) of the respondents planned to increase their next year's cross-country skiing participation over that of their 1976-1977 activity levels. Approximately

TABLE 4: Age and Marital Status of Skiers by Use Comparisons

Current vs. Previous Use	Median Age Groups	Percent Single
Less	20-24	83.3
More	30-34	38.5
Same	30-34	32.2

thirty percent planned to continue their present level of activity and only a little over two percent planned to reduce their number of skiing occasions.

If we look at the reasons for plans to ski more or less compared to the 1976-1977 levels, we see that new or increased interest accounted for the shift to more skiing, whereas, those who planned to ski less gave changed or changing opportunities as the principal reason (Table 5). These same basic reasons were given for current shifts in activity levels. Seasonal snow conditions

TABLE 5: Percentage of Respondents Indicating Specific Reasons for Planning to Cross-Country Ski More or Less

Reason for Change	% Indications Less Participation (n=22)	% Indications More Participation (n=685)
Changing Opportunities	50.0	37.3
Changing Interest or Attitude	31.8	46.8
Changed Skiing Conditions	22.7	11.3
Social Interactions	----	13.1
Other Reasons	9.1	11.1

(too little snow, poor due to warm weather, more snow, etc.) usually accounted for considerable temporary shifts and were not really a part of definable trends.

Another trend, which was noted in use patterns, surfaced as years of participation in cross-country skiing were compared with future involvement. For example, more than seventy-five percent of the respondents who had skied for more than a year planned to increase their participation in subsequent years, at least during the early years of involvement, after which use levels tended to level off. Most changes in activity levels or frequency were most dynamic in the participation years, 2 to 5, and more particularly with regard to those who had cross-country skied for three years. Within this group, 36.7 percent planned to increase their cross-country skiing activity in subsequent years. The median years of involvement for those planning to ski less was four years, five years for those planning to ski the same amount, and four years for those planning to ski more.

Availability of opportunity is a principal motivator for change in activity levels and a variable often expressed was that of proximity to skiing opportunities.

Travel Distance Trends in Cross-Country Skiing

One of the major differences between the behavior of the cross-country skier and the downhill skier has to do with the opportunity to participate. Within this variable, the distance a skier must go to participate in his chosen winter recreation activity becomes a significant element. Many cross-country skiers state they have greater opportunity to participate because they don't have to travel very far to find a suitable area for skiing. In 1976-1977, study respondents traveled a median distance on weekdays of 1-5 miles and and 6-10 miles on weekend days (Table 6). The median longest trip taken by cross-country skiers to an area for skiing was 41-60 miles.

For 64.3 percent of the respondents who had skied before 1976-1977, the areas where they skied in 1976-1977 were the same distance as previous years. (Table 7). For those who traveled closer to home, the median longest trip was between 41 and 60 miles; those who traveled further from home went from 81 to 100 miles; and the median distance traveled by those having the same travel patterns, was from 41 to 60 miles (Table 8). The comparisons of distance traveled by longest skiing trips taken, weekday travel, and weekend travel with those who declared that they had skied closer, further, or the same distance from home also provide some insight into behavioral trends (Table 9). In most instances, the cross-country skier is either skiing closer to home or at least is not going further away to ski. The high percentages of individuals who ski within a relatively close distance to home regardless of the shifts in their declared travel distances, perhaps would suggest that planners and managers should consider both proximity and basic motivations as prime criteria in evaluating what and where opportunities should be provided.

Although shifts in the distance traveled

TABLE 6: Travel Distance (one way) on Weekdays, Weekends, and Longest Trip

Miles	Longest Trip (%)	Average Weekend Travel Distance	Average Weekday Travel Distance
Less than 1	6.5	18.4	39.9
1-5	10.9	23.5	38.8
6-10	11.1	18.6	11.7
11-20	9.5	10.1	4.7
21-40	8.3	6.8	2.1
41-60	7.4	6.3	(over 40) 2.8
61-80	8.3	4.9	100.0
81-100	8.6	2.9	
101-125	6.5	2.7	
126-150	5.9	(over 125) 5.8	
151-175	3.0	100.0	
176-200	3.7		
201-300	6.4		
>300	3.9		
	100.0		

TABLE 7: Travel Distance for Cross-Country Skiing in 1976-1977 Compared to Previous Winters

Relative Distance Traveled	% of Respondents (n=626)
Closer to Home	13.7
Further from Home	22.0
Same Distance from Home	64.3

TABLE 8: Travel Distances (one way) by Percent of Skiers for Relative Travel Patterns on Weekdays, Weekends, and Longest Trip Taken.

Travel Distance (Miles)	Percent of Respondents								
	Weekday Travel			Weekend Travel			Longest Trip		
	Closer	Further	Same	Closer	Further	Same	Closer	Further	Same
less than 1	43.3	45.6	39.7	23.8	10.6	19.9	5.9	2.9	6.5
1-5	38.8	32.2	39.9	26.2	22.0	22.9	9.4	3.6	10.6
6-10	10.4	8.7	12.3	23.8	16.7	19.9	8.2	9.5	12.6
11-20	4.5	6.8	3.8	6.0	10.6	9.3	10.6	4.4	10.6
21-40	----	1.9	2.8	7.1	9.8	6.6	11.8	5.1	8.1
41-60 (over 40)	3.0	4.8	1.5	3.6	7.6	6.9	11.8	6.6	8.1
61-80				3.6	6.1	5.3	8.2	10.9	8.3
81-100				----	3.8	2.4	5.9	11.7	7.8
101-125				1.2	3.0	2.4	1.2	11.7	6.8
over -125				4.7	9.8	4.7	27.0	33.6	20.6
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 9: Skiing Activity Comparisons After Taking Up Cross-Country Skiing.

Amount of Downhill Skiing	% of Respondents Who Downhill & Cross-Country Ski
More	10.3
Same	23.8
Less	65.9

by the cross-country skier are interesting, some of the other trends seem to provide deeper insight concerning the participants in this activity. The relationships between downhill skiing, snowmobiling, and cross-country skiing are but a few of interactive trends which have been studied.

Downhill and Cross-Country Skiing Relationship Trends

In the Maine study, 74.9 percent of the cross-country skiers had participated in downhill skiing. Of these, 65.9 percent indicated that they had reduced their level of participation in downhill skiing since taking up cross-country skiing (Table 9). The reasons given for downhill skiing less were numerous and varied but high costs, crowding, and changed opportunity (time and facility proximity) were dominant (Newby and Lilley 1980). Among those who downhill ski less after taking up cross-country skiing, the high expenses of downhill skiing was indicated as a reason by 57.2 percent of the respondents. Additional reasons for the shifts in activity are given in Table 10.

TABLE 10: Principal Reasons for Decisions to Downhill Ski Less.

Reasons	% of Those Skiing Less
Downhill Expensive; X-C Cheaper	57.2
Cross-Country Skiing Less Crowded	27.2
Prefer Cross-Country Skiing	25.9
Downhill Skiing less Available	18.5
Cross-Country Safer & Within Abilities	13.4
Cross-Country More Available	11.7
Cross-Country Provides More Exercise	7.0
Dislike Downhill Social Atmosphere	6.0
Cross-Country Quieter	6.0
Dislike Downhill Skiing	5.4
Family & Friends Can Participate Better in X-C	4.3
Reason Not Related to Cross-Country	3.7
Other	8.6

For shifts in activity wherein those who had taken up cross-country but were downhill skiing more, the two principal reasons given were first, increased availability of downhill skiing opportunties (28.8% of participants) and secondly, an expressed preference for the downhill sport (23.8% of participants). Respondents who now downhill ski more expressed reasons which were less specific but do show similar kinds of criteria (Table 11).

TABLE 11: Principal Reasons for Decisions to Downhill Ski More.

Reasons	% of Those Skiing More (n=80)
Downhill Skiing More Available (Time, Proximity, etc.)	28.8
Prefer Downhill Skiing	23.8
Family Can Downhill Ski Also	3.8
Not Related to Cross- Country	5.0
Downhill More Exercise	2.5
Other	13.8

Research conducted by others has suggested that perceived high costs, crowding, and relative opportunity to participate are common concerns which shape the trends of winter recreation activities (Haas, et.al. 1980; Smith 1980; USDA, Forest Service 1980; Stynes 1980). There are sufficiently large enough numbers of individuals who both downhill and cross-country ski to warrant further analysis of the interactions in order that the concepts such as the opportunity spectrum concepts proposed by Driver and Brown (1978) might become applicable in day-to-day resource management. Trend data analysis and responsive flexible management programming can be achieved to more fully satisfy participant needs.

Participation in winter recreation activities is really more broadly based than many resource managers care to admit. They also tend to dislike accepting the fact that there are many "shared" elements of winter recreation activities but perhaps more importantly they tend to dismiss the oftentimes small incompatibilities which mean the difference between an "experience" and a "quality experience". Cross-country skiers and snowmobile users are often thrown into the same area to "experience" their individual activities, but can this be done? Are the experience differences great or are they relatively miniscule yet extremely critical to need satisfaction? Trend data produce some insights which are important to both user and resource manager, particularly when confronted with such seemingly incompatible activities as cross-country skiing and snow-

mobiling.

Cross-Country Skiing and Snowmobiling Interaction Trends

Of all the winter recreation activity combinations possible, cross-country skiing and snowmobiling seem to be the most polarized. Perhaps a look at some basic data may verify or refute this concept. In the Maine study of cross-country skiers, 34.8 percent of the respondents had either borrowed, owned, and/or rented a snowmobile during the 1976-1977 winter season (Table 12).

TABLE 12: Percentages of Respondents Sub-sample (n=363) who Borrowed, Owned, or Rented a Snowmobile.

Use Status	% of Respondents
Borrowed	27.4
Owned	16.0
Rented	2.5

Of those who had used a snowmobile (n=363), 72.7 percent indicated they used the snowmobile less often after they began cross-country skiing (Table 13). Interestingly, those who continued to snowmobile, generally tended to assume the role and perceived imagery of the activity in which they were participating. Where perceived conflicts surfaced, the cross-country skier (who may also snowmobile) tended to be more intolerant during participation, i.e., this individual might almost seem to be Dr. Jeckyl and Mr. Hyde, depending on which role or image he was currently adopting.

TABLE 13: Snowmobiling Activity (Percent) of Respondents After Taking Up Cross-Country Skiing.

Activity Levels	All Users	Source of Snowmobile		
		Borrowed	Owned	Rented
More	4.1	5.5	3.1	5.6
The Same	23.2	23.2	25.2	33.3
Less	72.7	71.3	71.7	61.1
	100.0	100.0	100.0	100.0

Some of the primary reasons for snowmobiling less were (a) dislike for snowmobiling, (b) more interest in cross-country skiing, and (c) reduced opportunity to snowmobile (Table 14). Such concerns as noise, smell, and environmental intrusion often were heavy contributors to dislike of snowmobiling and resultant reduced participation.

TABLE 14: Reasons For Snowmobiling Less After Taking Up Cross-Country Skiing (Percent of Respondents Where n=264)

Reason	% of Respondents
Dislike Snowmobiling	36.0
More Interested in Cross-Country	27.3
Less Opportunity to Snowmobile	21.6
Dislike Associated Environmental Impact	9.8
Cross-Country Provides More Exercise	9.5
Cost of Snowmobiling	8.3
Never Developed Taste for Snowmobiling	6.4
Family and Friends Don't Participate	3.4
Other	3.8

For those individuals who snowmobiled more after taking up cross-country skiing, the major reason for doing so was the increased opportunity, however, only 15 persons of the sample population (n=1042) had actually increased their snowmobiling activity. In most instances either availability of a snowmobile or desire to fully capitalize on machine investment were motivations behind greater or increased opportunity for snowmobiling.

The principal interaction between the cross-country skier and the snowmobiler was in the area of tolerance for each other. Snowmobilers expressed no concern with sharing an area with or encountering a skier, whereas the cross-country skier had almost unanimous intolerance for encounters with snowmobilers. When a snowmobiler also skied, he adopted basically the same attitude and expressed a strong dislike for what Newby and Warner (1980) described as the "crude bullies of field and forest". The intricacies of this role adoption are interesting and suggest perhaps that trend evaluation must address what might be termed the "psychological contracts" associated with participation in each recreation activity.

IMPLICATIONS OF TREND ANALYSIS

Researchers who develop trend data and those who interpret that data frequently lose sight of a real value associated with understanding trends, i.e., the potential to satisfy human need through better management. With the complex array of opportunities in winter recreation, it is pathetic and perplexing that the research being done has no common

focus -- no deliberate attempt to solve management problems or address human need. In a recent symposium, no less than fifteen papers were presented on cross-country skiing topics. Those in the audience who came seeking possible management solutions went away shaking their head, wondering why all the existing data were not analyzed and focused to help them. After all, isn't there a difference between applied research and pure research? Yet, from a research standpoint the symposium was a success, mainly because the data were broad and deep in scope, nontheless, the interpretations were narrow and shallow. Why? To help answer the question, let's explore the issue of cross-country skiing and the application of current trend analysis.

Trend data for comparison between cross-country skiing participants on weekends versus weekdays shows that cross-country skiing is distributed throughout the week. This might eliminate the need to manage for peak periods on weekends -- or does it? We also see that weekday users ski fewer hours per day (2.6 hrs.) than weekend users (4.2 hrs.) but ski more days per season. In addition, weekday skiers ski closer to home but may double their travel distance for a weekend trip. Obviously this suggests potential marketing analysis -- but does it really tell managers what they want to know about providing opportunities and meeting needs? Quantification often provides results which are too abstract, too esoteric, too general, or too specific to be of use to managers and planners. Indeed, the researcher may prove his results to be reliable, but he may also prove them to be invalid and useless within the realms of practical assistance to the manager. Many managers are concerned about shifts... shifts from or among winter recreation activities. What are these shifts and what are the frequencies or relative permanancies of these shifts? Most changes are occurring during the active learning years of involvement with an activity, ie., during the third to sixth years. These are the years most critical to supply/demand decisions, therefore, sensitivity to reasons or motivations to change, to adopt, to complement, or to drop an activity is of particular importance to managers.

Perhaps the image held of a recreation activity may be the best barometer to measure shifts. Think about it; what are the popular images today? What were they five years ago? Possibly, images and imagery may be more important to understand than the motivations for a particular behavior pattern. A tragic flaw in the analysis of trend data is that participant responses are often tailored to fit their image of what an activity is all about. Their participation is often a reflection only of the individual's desire to adopt the image of the activity -- that's their motivation. Cross-country skiers may well be skiing more on weekdays than weekends because it is easier to assume the role or image on weekdays. The image (myth induced) of the cross-country skier most often articulated vocally and pictorally is that of a solitary figure etching fine lines in the unbroken snow -- an image that is new, unique, and wholesome -- an image as complex as the people adopting it (Newby and Warner 1980). Weekend use is often social interaction motivated and the antithesis of the imagery of the cross-country skier. The motivations (image adoption) are undoubtedly different and management action to satisfy motivated need must also be different.

The concept of image adoption is not new nor are the principles undefined or unresearched, however, the question might be asked, does image adoption reflect the inner self and result in behavior which is definitive in terms of image consciousness and image strength? Images may be the vehicles for various degrees of self-expression and may be tailored to counter the physical, psychological, social, and economic constraints imposed on the individual. The myths, images, and behavior associated with cross-country skiing are probably more important to understanding this winter activity than are all the long arrays of computer-generated data combined. The numerous statistical profiles available are informative and often impressive but not terribly enlightening.

When only the experience itself is analyzed, a great deal of confusion begins to surface. Are we perhaps leaving out the land resources? After all this is the setting or backdrop for the activity -- this is what the managers must also manage. A sense of identifiable "place" (having a specific image) is also a requirement in the image fulfillment. In short, the researchers should be acutely aware of the "psychological contract" that rests in the minds of the participants...the contract that is written in mental images and is either fulfilled or denied by the actual participation in the activity within a certain setting or place. Each image, each place, each psychological contract helps define how to meet the individual's needs, and these are all part of the trend analysis leading to management problem-solving.

To date researchers have not programmed the image of a user and his resource into a computer terminal. That is not to say it won't be done before long, but it is important to remember that a land resource has definable attributes which create images in function as well as form. Users probably seek out particulr resources (landscapes)

which meet the requirements that they have mentally created to meet their needs, motivations and preferences. If this sounds like a myth, that is exactly the point, because imagability is often associated with mental projections of myths and the desire to identify with those myths as part of the behavioral progression within the basic needs hierarchy.

The paradox of images and myths is that they are real; they are manufactured; they lead to stereotyping; they are associated with self-image; they create identity; and their adoption supports concepts of self. They are the foundation of the imagability of a recreation activity. Yet, we know so very little about them because our data collection and interpretations focus on quantification of users and participation patterns. The interaction of resource imagery with the myths and the images supporting a particular activity has been and perhaps will continue to be the most difficult variable for the researcher to isolate.

Perhaps this is the time to stop making the pretense that all qualities are quantifiable and those qualities which are not quantified are not important. The scientist clad in white coat and clutching his volumes of computer print-outs may have valuable information and he may prove his objectivity, but many managers don't seem too impressed these days. They still have their problems to solve. Perhaps the trend of trend data analysis should be to bring the interpretation of trends within a context of imagery, image adoption, image fulfillment and behavior profiles which effect not only the users but the managers' resources. Certainly this will require some innovative procedures for using quantified data within the more qualitative realms but the rewards may be more richly rewarding than the everpresent cry -- "MORE DATA IS NEEDED!" Much of these types of data are available for winter recreation activities. We just seem to lack the imperative needed to reach out beyond the secure bounds of quantification and cautious extrapolation. Perhaps now is the time to start a trend... a trend that sythesizes the existing quantitative and qualitative data into a net result which is capable of solving problems for resource management and human needs.

LITERATURE CITED

Ballman, Gary. 1980. Operationalizing the cross-country skiing opportunity spectrum. Proceedings of the North American Symposium on Dispersed Winter Recreation, University of Minnesota, St. Paul, MN. pp. 31-35.

Brown, P.J., B.L. Driver, D.H. Bruns, and C. McConnell. 1979. The outdoor recreation opportunity spectrum in wildland recreation planning: Development and application. Proceedings of the First Annual National Conference on Recreation Planning and Development, American Society of Civil Engineers, New York, NY, Vol. 2, pp. 527-538.

Driver, B.L. and S.R. Tocher. 1970. Toward a behavioral interpretation of recreational engagements, with implications for planning. In B.L. Driver (Ed.) Elements of outdoor recreation planning, University of Michigan, Ann Arbor, MI, pp. 9-31.

Driver, B.L. and R.C. Knopf. 1977. Personality, outdoor recreation, and expected consequences. Environment and Behavior 9(2):169-193.

Driver, B.L. and P.J. Brown. 1978. The opportunity spectrum concept and behavioral information in outdoor recreation supply inventories: a rationale. Proceedings of the Integrated Inventories of Renewable Natural Resources Workshop. USDA, Forest Service, Tucson, Arizona. pp. 24-31.

Haas, G.E., B.L. Driver, and P.J. Brown. 1980. A study of ski touring experiences on the White River National Forest. Proceedings of the North American Symposium on Dispersed Winter Recreation, University of Minnesota, St. Paul, MN. pp 25-30.

Hendee, J.C. 1974. A multiple-satisfaction approach to game management. Wildlife Society Bulletin 2(3):104-113.

Keith, J.E. 1980. Snowmobiling and cross-country skiing conflicts in Utah: Some initial research results. Proceedings of the North American Symposium on Dispersed Winter Recreation, University of Minnesota, St. Paul, MN pp. 154-160.

LaPage, W.F. 1971. Cultural "Fogweed" and outdoor recreation research. Proceedings of the Forest Recreation Symposium, State University of New York College of Forestry, Syracuse, NY, pp. 186-193.

Newby, F.L. and W.D. Lilley. 1978. Cross-country skiers in Maine: A preliminary study. Life Sciences and Agriculture Experiment Station Misc. Report No. 197, University of Maine, Orono, ME.

Newby, F.L. and W.D. Lilley. 1980. Cross-country skiers: Are they really different? Proceedings of the North American Symposium on Dispersed Winter Recreation, University of Minnesota, St. Paul, MN, pp. 52-56.

Newby, F.L. and W.S. Warner. 1980. Cross-country skiing: Images, myths, and behavior. Unpublished booklet used in the poster session of the North American Symposium on Dispersed Winter Recreation, University of Minnesota, St. Paul, MN.

Smith, C.K. 1980. Ski touring in the Twin Cities area. Proceedings of the North American Symposium on Dispersed Winter Recreation, University of Minnesota, St. Paul, MN, pp. 42-46.

Stynes, D.J. 1980. Interrelationships among three outdoor winter sports. Proceedings of the North American Symposium on Dispersed Winter Recreation, University of Minnesota, St. Paul, MN. pp. 132-138.

USDA, Forest Service. 1980. Growth potential of the skier market in the National Forests. USDA For. Serv. Res. Pap. WO-36, 31 p.

A POSSIBLE RAILROAD ORIENTED SCENARIO IN POTOMAC RIVER BASIN PLANNING[1]

George H. Siehl[2]

A trend may develop in which railroads become lifelines between rural and urban populations. For instance, the railroad along the Potomac River presently serves commuters from Washington's western suburbs. The railroad could be used to reclaim surface mined areas in the upper portion of the Potomac. These same lines can also open western Maryland as a recreation resource to Washington, D.C., residents. Multiple use of railroads is a trend recreationists would find beneficial.

My remarks are directed to one possible future for recreation in the Potomac River Basin, a future which would see the expanded use of the existing railroad system through the basin. The scenario is an extension of a report done for the Senate Committee on Governmental Affairs in 1979. A version of the report has been reproduced by the Congressional Research Service with permission of the Committee under the title Outdoor Recreation Consideration in River Basin Planning and Management. Copies are available upon request.

The purposes of the report were listed as:

1. To identify and review some of the new river relevant resource management and environmental programs that have been authorized since the early 1960's;

2. To show some of the changed public perceptions of river and other natural resource management approaches;

3. To discuss pertinent shifts in public sentiment toward the issues of economic growth and the role of government;

4. To anticipate the possible changes which may follow from the above considerations with regard to outdoor recreation and landscape preservation; and

5. To apply these considerations to a single river basin, the Potomac, and speculate on how these considerations, and perceptions might be incorporated in planning for the future of that basin.

It is to the last of these purposes that this paper is addressed.

TOMORROW'S POTOMAC

Tomorrow's Potomac--and Tomorrow's America--are not likely to be based upon recreation; neither is it likely, one hopes, that issues such as war and peace, energy supplies, or interpersonal relations will worsen to the point where life is reduced to a stark, continual struggle for survival. Recreation is not the most important matter before our elected leaders, but it is important enough to deserve consideration when issues of greater import are being decided. Within this framework, what are the prospects for recreation in the Potomac River Basin?

First, the Potomac Basin Planners could make use of any of the new approaches to resource management which have been developed elsewhere by the federal, state, or local governments or by the private sector. To the extent that these off-the-shelf approaches are not compatible with the specific circumstances of the Potomac River Basin, they can be adapted to specific needs and situations in the Potomac region.

Additionally, the abundant intellectual resources of the Potomac Basin could supply new approaches to managing the man-land interaction. These new approaches might best be directed to forging programs which deal with environmental

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2]Analyst in Environmental Policy, Congressional Research Service, Library of Congress, Washington, D.C. 20540.

problems while providing recreational benefits, and to developing an energy/transportation system which allows for continuation of a broad range of recreational outlets. While these two concepts do not exhaust the possible new approaches to affording recreational opportunities in the Potomac River Basin, their implementation could do much to ensure that outdoor recreation options could be increased as needed.

Mined Land Reclamation

As an example of the kind of environmental problem which might be solved so as to provide recreational benefits as a byproduct, there is the matter of surface mining of coal in the upper portion of the Potomac Basin.

The mountainous reaches of the upper basin are generally under forest cover or in some kind of agricultural use. In this condition they provide economic returns through the harvesting of timber or agricultural products; wildlife habitat is undisturbed; a variety of recreational activities is possible; and any off-site environmental damage is minimal.

When surface mining takes place, the timber must be harvested on a one-time basis before mining begins, and the coal is recovered. These would be the economic benefits of mining. Negative factors involved in surface mining include elimination of the recreation potential; loss of wildlife habitat; and, in many cases, the beginning of serious off-site environmental damage such as siltation.

In the post mining phase, if there is no reclamation, the situation results in no economic costs to restore the contour and vegetation of the site, but places the land in condition to be used for other purposes and eliminates off-site environmental damage.

Imaginative programs for reclaiming surface mined mountainous areas could include use of the mined area by the coal cars which now return there empty.

Similarly, sludge from water treatment plants could be brought in to facilitate the process of revegetating the landscape or upgrading the soil for agricultural use.

While these actions would help to solve several environmental problems, recreation could benefit through use of the area for appropriate outdoor activities. Off-road vehicles could use a part of the area and the reclamation plan could lead to development of an area suitably contoured for downhill skiing. Restoration of vegetative cover which could provide food and shelter for wildlife could increase hunting opportunities. Creation of lakes or ponds on the previously mined lands could provide water-based recreational opportunities. In some cases, where chemistry of the water would permit, fishing might be possible as one of the recreational uses.

Experience elsewhere has shown each of these elements to be possible.[3/] An all-out effort by private and public sectors working together might be able to try all of these programs and make them work in the region. There are, however, technical and temperamental obstacles to making such a comprehensive effort succeed.

Rails as Trails

A transportation program which could have multiple benefits accruing to the public and private sectors of the basin economy would be the development of recreation oriented railroad service to western Maryland.

The rail lines are in place and Amtrak passenger trains now travel the route passing through a number of small communities which are close to outdoor recreation centers. These include Maryland's Deep Creek Lake (which is in the Ohio Basin drainage, but this can be overlooked for purpose of discussion), Blackwater Falls and Canaan Valley State Parks in West Virginia, and a number of points on the Potomac River much used by hikers, campers, fishermen, and boaters. The Amtrak passenger trains make only a limited number of station stops along this route, and the schedule does not closely match what would be ideal for recreational users. This Amtrak route (Washington, D.C., to Cincinnati, Ohio) is one that the Department of Transportation had proposed to eliminate, but the route is to operate for about a year pending further evaluation.

Components of the program would include:

1. Use of existing or added railroad passenger trains to provide access to upper basin communities for outdoor recreationists;

2. Development of these communities to provide needed services and/or accomodations to the visitors;

3. Development of transportation systems to move visitors from the communities to specialized recreation areas;

3/ For instance, see the section on reclamation in U.S. Congress. Senate. Committee on Interior and Insular Affairs. The Issues Related to Surface Mining: A Summary Review, with Selected Readings. (Committee Print) Washington, U.S. Govt. Print. Off., 1971. 255 p.

4. Expansion or creation of specialized outdoor recreation areas, as needed.

In the case of downhill skiing, for instance, the program might work, as follows, during an assessment period. Skiers would leave the Washington area on a rescheduled Amtrak train at about 6:00 p.m. on Friday evening, reaching Oakland, Maryland, at about 11:00 p.m. They would be transported to their lodgings in vehicles provided by the lodge or motel at which they were to stay. (This transport could be something as simple as a contractor-owned school bus or, if the program justified it, a more elaborate motor coach.) Destinations could be the Wisp ski area near Deep Creek Lake in Maryland, or the previously mentioned Canaan Valley, West Virginia. Snowshoe ski area in West Virginia would be another possibility, although its distance from Oakland would make for a rather late arrival on the schedule being considered. Following a weekend of skiing, the process would be reversed, and the recreationists would be returned to the Washington area Sunday evening.

Should the program prove successful, it could possibly lead to development of a new downhill ski area in the vicinity of Cumberland, Maryland, if the mountainous terrain and snow cover there prove suitable. Much of this land is in private ownership, providing an opportunity for further involving the private sector in increasing recreational opportunities.

The benefits to be derived from this program would include expanded and more accessible recreational opportunities (many young people living in the urban area are interested in such activities, but do not own an automobile). Also, there would be expanded employment opportunities in essentially rural areas.

The rail recreational access program would function equally well in summer. In Norway, for instance, it is a common sight on the trains which cross the mountains between Oslo and Bergen to see a group of hikers step from the train, their packs from their backs, and set off on foot for hostels or campgrounds. There would appear to be no reason why a similar situation would not prevail in the Potomac Basin. In fact, the recent popularity of biking might be accommodated through this system, as well.

Apart from Amtrak, another source of railroad rolling stock which might become available within the Potomac Basin in the next several years is the equipment used for commuter traffic into Washington, D.C., on weekdays. The state of Maryland, which provides financial support for this rail commuter service through its Department of Transportation, has recently arranged to purchase additional equipment to expand the system. Some 22 cars to be acquired will be refurbished and placed in operation, probably not before the end of 1980 or early 1981. Once operational, however, the state might be interested in allowing them to be used, perhaps on a lease basis, for the recreational access program on weekends. In this way, a portion of the costs of acquiring the cars might be offset, and the recreational access program would be more flexible. It would be necessary to limit use of the cars in such a way that maintenance, which is done on weekends, could be performed in a timely fashion.[4/] Other recreational train potentials: hiking, bicycling, resort living, fishing, trips, boating, C & O Canal towns, historical towns.

Whether or not these ideas come to play a part in shaping Tomorrow's Potomac, the larger concern is how that future is to be shaped. That it will be different seems certain; the means of making it so are uncertain.

[4/] Telephone conversation Sept. 5, 1979, with J. H. Griffin, Manager of Passenger Operations, Baltimore and Ohio Railroad Company.

CHANGES IN RECREATION ORIENTED TRAVEL IN THE NORTHEAST BETWEEN 1972 and 1977[1]

Gerald L. Cole[2]

Abstract.--Data from the National Travel Surveys of 1972 and 1977 are utilized in a modified shift-share approach to compare Northeastern travel with other regions of the U.S. The Northeast is losing relative to other regions when travel is compared using 1972 as the base year. However, travel with camping equipment increased in the Northeast relative to the other regions.

INTRODUCTION

One of the sub-objectives of the NE-100 regional research project at Northeast Agricultural Experiment Stations has been to utilize secondary data sources as a means of detecting changes in trends in outdoor recreation participation. This paper focuses on the National Travel Surveys conducted in 1972 and 1977 by the U. S. Department of Commerce.

Data tapes for both surveys were released to research personnel at the University of Vermont, enabling a comparison between the two survey years. For the households sampled, all travel for trips of 100 miles or more from home was recorded by purpose of the trip, mode of travel and origin and destination of the trip. Also, person trips (number of trips x number of persons) and person nights (person trips x number of nights away from home) were included.

This paper was developed because of some hypothesized changes occurring in the Northeast region which could affect the recreation-tourism sector. It may be useful to outline some factors associated with travel and then elaborate on some hypotheses concerning the region. Variables which affect the demand for travel include population, income, education and family size. On the supply side, the natural resource base for tourist attractions, highway availability and condition, together with technological advances, will also be important.

It is hypothesized that the demand for travel in the Northeast will slow because of slower population growth compared to other regions of the U.S. Pennsylvania, New York, Rhode Island and the District of Columbia are estimated to have population decreases between 1970 and 1977. While incomes have continued to increase in the region, price increases for some consumer goods have outstripped income growth. This is especially true for gasoline prices which have risen sufficiently to cause a reduction in fuel used between 1979 and 1980. It is hypothesized that higher fuel prices will reduce the demand for travel not only for persons originating their trip in the Northeast region, but especially for those from outside the region.

Continued increases in the level of education and the trend towards smaller households (including one person households) should spur an increased demand for travel which may partially offset the negative effects of reduced population growth and higher fuel prices.

On the supply side, it is hypothesized that those natural resource attractions which are within 100-150 miles of important population centers will have an advantage over more remote areas. To illustrate, the Delaware, Maryland and New Jersey shores together with Cape Cod, will be in a better relative position than attractions in Northern New England.

New technological developments which promote more fuel efficient recreation vehicles, outboard engines, etc. can also stimulate participation in camping and boating.

---

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2]Associate Professor, Dept. of Agricultural and Food Economics, University of DE, Newark. The valuable assistance from Malcolm I. Bevins and Jed Guertin, University of VT, is greatly appreciated. Bevins presented a preliminary analysis of some of the possible uses of the National Travel Survey Data at a NE-100 research meeting. Guertin provided computer programming assistance.

OBJECTIVE

The objective of this paper is to utilize the travel data from the two survey years in order to indicate shifts in the shares of travel and other related factors by state, region - Mid-Atlantic, New York-New Jersey, and New England - and the Northeast between 1972 and 1977, compared to other regions and the U.S. Shifts in travel market shares will be compared with population growth shares for the same states, regions and the U.S.

PROCEDURE

A modification of shift-share analysis will be used to measure changes in the state and regional travel share compared to the U.S.

Shift-share analysis is a technique for measuring factors which relate to differences in growth rates among regions. The technique was developed by Dunn who states:

> "Regional development takes place in a national framework and depends in part upon forces operating at the national level. As output and income grow, the demand for different commodities grows at different rates. Likewise, on the supply side, technological change leads to differential shifts. The impact of changes at the national level affects regions in different ways because of differences in the composition of their output." [3]

In this paper, the number of person nights of travel in 1972 and 1977 by state of destination will be used as the variable to measure shifts. It is argued that person nights provide the best available measure of economic impact because both the number of persons in the travel party and the number of nights spent on the trip are recorded.

An analysis of other state and regional travel data utilizing SPSS provides additional indicators of growth or decline in the travel market within the region.

RESULTS

Population growth and shift-share

It is well known that population growth in the Northeast has not kept pace with other regions since 1970. While U.S. population increased 6.4 percent between 1970 and 1977, the Northeast region's population increased only by 1.4 percent, Table 1. The Northeast region in this study includes 13 states and the District of Columbia.[4] Population grew fastest in the South and in the Northwest.

A shift-share analysis of population compares not only the percentage increase, but also the 1970 base population in each of the states and regions. In order to calculate what will be called the Population Share Index Value, the following formula is used:

$$\text{Population Share Index Value} = \left[\text{Base population for state or region (1970)}\right] \left[\text{Percentage change in state or regional population from 1970-77} - \text{Percentage change in U.S. population from 1970-77}\right]$$

Table 1. Population growth for the United States, by region, and for Northeastern states between 1970 and 1977.a/

Region	1970	1977	Percent change
	- - (000) - -		
U.S.	203,806	216,332	6.4
New England	11,883	12,242	3.3
ME	997	1,085	9.2
NH	742	849	15.0
VT	446	485	8.7
MA	5,706	5,782	1.6
RI	951	935	-1.6
CT	3,041	3,108	2.5
NY-NJ	25,461	25,253	-0.8
NY	18,268	17,924	-1.7
NJ	7,193	7,329	2.2
Mid-Atlantic	23,468	24,190	3.1
DE	551	582	6.1
DC	756	690	-8.8
MD	3,938	4,139	5.5
PA	11,813	11,785	-0.1
VA	4,659	5,135	10.4
WV	1,751	1,859	6.6
Northeast	60,812	61,685	1.4
South	37,573	41,803	11.2
North Central	46,960	47,911	2.0
Northwest	7,097	7,957	12.1
Southwest	23,555	26,254	11.4
Pacific	27,811	30,722	10.5

a/ Source: U. S. Department of Commerce, Statistical Abstract of the United States - 1978, pp. 14-15.

[3] Dunn, Edgar S., Jr., "A Statistical and Analytical Technique for Regional Analysis," The Regional Science Assoc., Papers and Proceedings, Vol. VI (1960).

[4] Some of the names of travel regions were changed in 1977 compared to the 1972 National Travel Survey. In this paper, the 1972 names will be used. See Appendix A for the definitions of travel regions.

The result of these calculations is shown in Figure 1. The position of each state or region on the bar chart is based on (1) the size of the 1970 population, and (2) whether the state or regional percentage population change between 1970 and 1977 was greater or less than the U.S. change. Thus, if the state or region had a population change which exactly coincided with the U.S. change, the index value would equal zero, i.e. would be on the base line. If the regional change was greater than the U.S. change, the index value would be positive and conversely, if the regional change was less than the U.S. change, the value would be negative.

The Northeast region shows the greatest negative index value and the Southern region the greatest positive value. Regions also showing a negative share index include North Central, New York-New Jersey, Mid-Atlantic and New England. The Northeast value is a composite of the New York-New Jersey, Mid-Atlantic and New England regions.

On the positive side of the base line, in addition to the Southern region, are the Northwest, Pacific and Southwest regions. While the Northwest region had the largest percentage population growth between 1970 and 1977, the smallest base population of any of the regions resulted in a smaller positive index value.

Among the individual states in the Northeast, only five grew at a faster rate than the U.S. and exhibited positive values. Only Virginia among the five had a population over one million. Therefore, the values do not deviate significantly from the base line.

On the negative side, Pennsylvania and New York, the two most populated states in the Northeast, both lost population between 1970 and 1977. The combined effect of population loss in New York, Pennsylvania, Rhode Island and the District of Columbia, together with population growth at less than the national rate in seven other Northeastern states, generated the negative Northeast index value.

The bar chart provides a measure of relative growth and decline in state and regional population shares between 1970 and 1977. Population growth or decline is one of the most important variables affecting travel in the regions.

Person nights of travel and shift-share

Using the same procedure as for the population analysis, state and regional growth in person nights of travel is indicated in Table 2. Data for the smaller states were not published in 1972. Therefore, a state comparison for Connecticut, Rhode Island, New Hampshire, Vermont and Maine is not possible. However, data for the New England Region are available. While the number of person nights of travel increased 26 percent nationally between

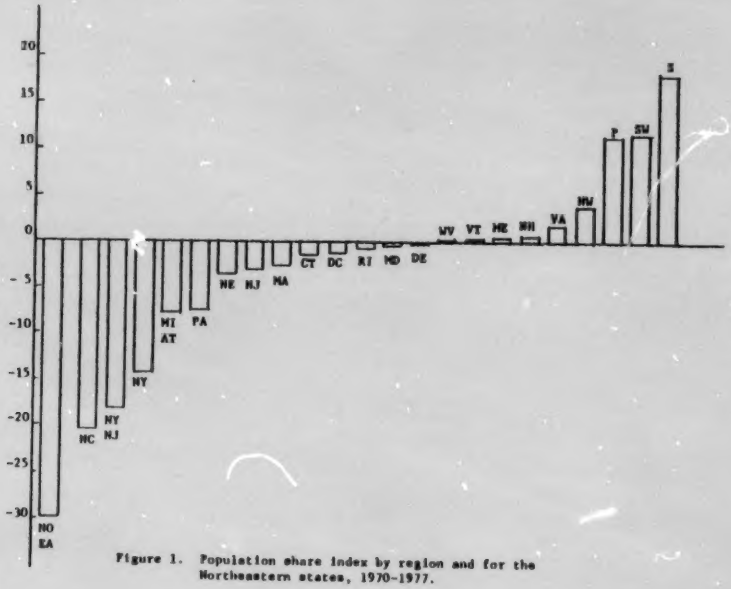


Figure 1. Population share index by region and for the Northeastern states, 1970-1977.

1972 and 1977, the increase in the Northeast was only 15.9 percent and the New England states registered a smaller 5.5 percent increase. Within the Northeast, person nights of travel actually decreased by 8.3 percent in Pennsylvania.

Table 2. Person nights of travel for the United States, by region, 1972-1977.a/

Region	1972	1977	Percent change
	- (000,000) -		
United States	1,906.0	2,367.3	26.0
New England	97.0	102.3	5.5
NY-NJ	101.1	120.3	19.0
Mid-Atlantic	137.6	166.4	20.9
Northeast	335.7	389.0	15.9
South	385.2	501.5	30.2
North Central	278.7	354.0	27.0
Northwest	91.6	118.3	29.1
Southwest	207.0	290.1	40.1
Pacific	272.1	325.4	19.6

a/ Source: U. S. Department of Commerce, Bureau of the Census, 1972 and 1977 National Travel Surveys.

In other regions, the Southwest exhibited a 40.1 percent increase followed by the South and the Northwest.

Within the Mid-Atlantic states, increased travel to the District of Columbia and Virginia exceeded the national increase.

A shift-share analysis of person nights of travel by destination state or region is presented in Figure 2. The formula for computing what will be called the Travel Share Index Value is as follows:

$$\text{Travel Share Index Value} = \left[\text{Base person nights of travel for state or region (1972)}\right] \left[\text{Percentage change in state or regional person nights of travel from 1972-77} - \text{Percentage change in national person nights of travel from 1972-77}\right]$$

Again combining the magnitude of the base year travel with the percentage deviation from the National increase, the largest negative value is obtained for the Northeast region and the greatest positive value for the Southwest. If travel had changed from the base year by region in the same relative proportion as population growth, the ranking of states and regions would be the same as in Figure 1. However, this is not the case. For the travel index, the Southwest gained relative to the South when compared to population index. The value for the Pacific region is negative, while the population value was positive.

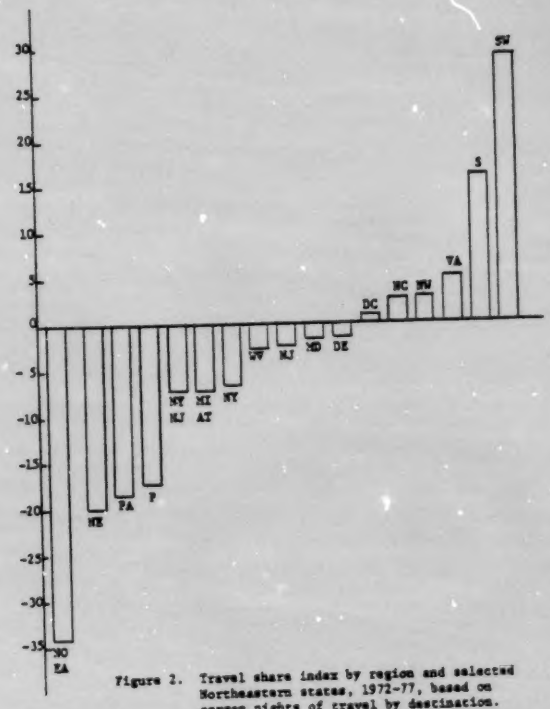


Figure 2. Travel share index by region and selected Northeastern states, 1972-77, based on person nights of travel by destination.

Within the region, only the District of Columbia and Virginia exhibit positive travel index values. Clearly the New England states, New York-New Jersey and the Mid-Atlantic states are losing relative to national growth. The North Central region is the only other region to show a negative value.

Not all states or regions have matched population growth with growth in travel. A causal relationship cannot be established from a shift-share analysis. Only a descriptive analysis of the changes is possible. The description can serve as an indicator of a need for further investigation of the reasons for variation in travel. It is clear that the Northeast is losing relative to other regions except for the Pacific region. Because the regional and state patterns of travel growth are not the same as the

patterns of population growth, it is evident that more than the population variable is affecting travel. This suggests the need for additional investigation of supply variables and other demand variables in the states or regions most affected, i.e., those which deviate from the base time. For example, are the historical-governmental attractions in the D. C.-Virginia area serving as a major attractant? Are the attractions in Pennsylvania such as Gettysburg, the Amish Country or the Poconos, losing favor? Are the natural resource attractions in Northern New England too far from population centers?

Camping travel shift-share

One indicator of the intent of travelers is whether or not they travel with camping equipment. In the National Travel Survey, trips by personal vehicle with and without camping equipment are recorded. Nationally, person nights of travel with camping equipment is a relatively small part of total travel. The proportion of travel with camping equipment varies from three percent in the New York-New Jersey region to 17 percent in the Northwest.

The increase in person nights of travel with camping equipment across the U.S. was quite modest - 3.6 percent - between 1972 and 1977, Table 3. Regionally, a much different pattern emerges than was the case with all travel. The New England and Mid-Atlantic regions showed substantial percentage increases in camper travel with smaller increases in the South and Southwest. Major declines were noted in the Pacific and New York-New Jersey regions with smaller decreases in the North Central and Northwest regions.

Table 3. Person nights of travel with personal auto/truck and camping equipment, by region, 1972-1977.a/

Region	Person nights of travel		
	1972	1977	Percent change
	- - (000) - -		
United States	160,244	165,990	3.6
New England	7,075	9,678	36.8
NY-NJ	4,564	3,756	-17.7
Mid-Atlantic	8,751	12,596	43.9
Northeast	20,390	26,030	27.7
South	31,971	37,674	17.8
North Central	22,354	21,170	-5.3
Northwest	20,819	19,714	-5.3
Southwest	23,570	28,581	21.3
Pacific	41,140	32,821	-20.2

a/ Source: U. S. Department of Commerce, Bureau of the Census, 1972 and 1977 National Travel Survey.

Using the same procedure as with population and total travel, a Camper Travel Index Value is computed as follows:

$$\text{Camper Travel Index Value} = \left[\text{Person nights of travel with camping equipment in base year (1972)}\right] \left[\text{Percentage change in state or region. person nights with camp. equip. from 1972-77} - \text{Percentage change in national person nights of travel with camp. equip. from 1972-77}\right]$$

In this instance, the greatest negative value is generated for the Pacific region and the greatest positive value for the Northeast, Figure 3. The Pacific region had the largest amount of travel in the base year and the greatest percentage declines. The positive effect of the large percentage increases in New England and the Mid-Atlantic region relative to the U.S. were the major factors in generating a large positive index value. Thus, even though the Northeast has lost population relative to the U.S. and total person nights of travel have decreased compared to the National rate of change, camper travel has increased.

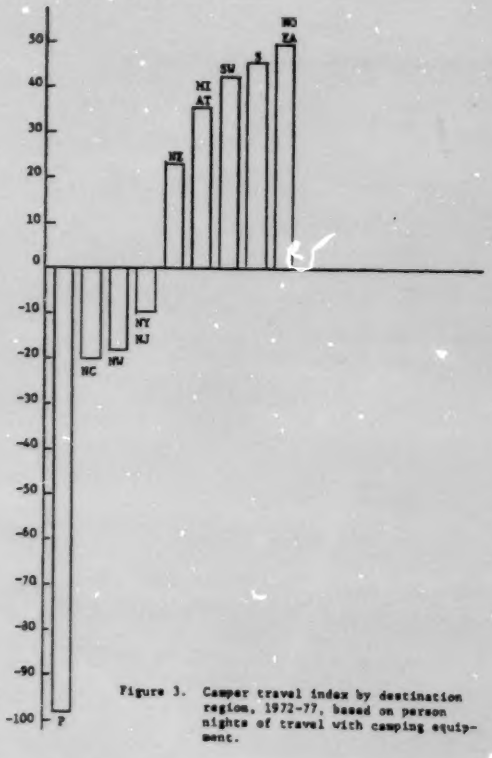


Figure 3. Camper travel index by destination region, 1972-77, based on person nights of travel with camping equipment.

Unfortunately, the lack of the data for the New England states in 1972 (except for Massachusetts) makes a comparison of individual states within the region and nation impossible. Data will be available in future census years, however.

Other comparisons from travel survey data

Numerous comparisons are possible using the National Travel Survey from 1972 and 1977. Selected comparisons follow as examples of possible analyses.

Origin - destination analysis of travelers

For marketing of recreation-tourism services it is essential to know the origin of travelers in order to better pinpoint advertising efforts and to be able to forecast possible impacts due to projected changes in population growth, fuel costs, etc.

An analysis of the origin of travelers to the Northeast (New England-New York-New Jersey and Mid-Atlantic regions) will serve as an example of the type of information that can be generated. Data for Connecticut are illustrated in Table 4.

Table 4. Origin of trips to Connecticut, by region, and selected states, 1972 and 1977.

Origin (Region or state)	Percent of trips 1972	1977
New England	37.4	42.2
NY-NJ	33.4	31.6
Mid-Atlantic	14.8	9.8
Sub-total	85.6	83.6
South	4.8	6.8
North Central	5.2	6.5
Northwest	.2	.2
Southwest	1.6	.7
Pacific	2.4	2.0
Total	100.0	100.0
Major States -		
MA	23.2	31.3
NY	22.8	13.3
NJ	10.6	18.3
RI	6.4	5.0
PA	5.6	5.8
MD	4.0	1.0
	71.6	74.7

In Northern New England, over 90 percent of all trips to Vermont, New Hampshirre and Maine originate in the Northeast and the share from within the region increased for Vermont and New Hampshire between 1972 and 1977. As indicated earlier, the population growth in the Northeast is slower than elsewhere in the U.S. and/or is generated in states with a small population base. If higher fuel costs further deter travel from more distant regions, this has an important potential negative impact on Northern New England. Some impact is already being felt since the total number of trips to Vermont and Maine decreased between 1972 and 1977.

Southern New England (Connecticut, Massachusetts and Rhode Island) is only slightly less dependent on the Northeast for its' travelers. The share for all three states is between 80 and 90 percent. However, Massachusetts, the most populated state, suffered a 22 percent decline in the number of trips between 1972 and 1977. The fact that Southern New England draws a slightly greater share of travelers from outside the Northeast can provide a negative impact as fuel costs escalate.

In the New York-New Jersey region, New York's dependence on the Northeast region increased between 1972 and 1977 primarily due to a decline in travelers from the North Central region. Both New York and New Jersey had 80 percent of their travelers originating in the region in 1977.

New Jersey's proportion of visitors from the Southern region nearly doubled but the proportion from the North Central region was cut in half. This could be due to travel distances. One might further speculate about future impacts in New Jersey with the present and expanding availability of casino gambling in Atlantic City. This can attract travelers from greater distances, particularly by public transportation.

Among the Mid-Atlantic states in the southern part of the Northeast, only Delaware depends on the Northeast for over 90 percent of the travelers coming into the state. An increasing proportion of the travelers came from the Southern region to the Mid-Atlantic states between 1972 and 1977. This was especially true for Virginia and West Virginia. A declining share of travelers came from the North Central region. West Virginia was most dependent on the North Central states.

The Southern states in the Mid-Atlantic region, being closer to the Southern region, may expect a positive impact from increasing population provided that rising fuel costs don't completely offset the effect of population.

While the entire Northeast region will likely be adversely affected by low or zero population growth among some of the states in the region, there will likely be states in the southern part of the region that may expect to enjoy future growth in the travel market largely generated from the South. Continued monitoring of the county employment and expenditure data from other sources will better establish a causal relationship.

Purpose of trip

In the Northeast region, with the exception of Southern New England, there was a slight upward trend in the proportion of trips made for outdoor recreation, entertainment and sightseeing purposes, i.e. non-business and non-family related travel. Recreation, entertainment and sightseeing travel as a group accounted for 20-30 percent of total travel for the region with a gain of approximately two percentage points between 1972 and 1977.

Mode of transportation

There was a slight down trend in the use of private vehicles for travel. Even though New England is more dependent than the remainder of the Northeast on private transportation, the private share decreased from 85 to 82 percent between 1972 and 1977. Elsewhere in the region the private share declined from 76 to 71 percent. Thus, public transportation is making a slight gain. It will be interesting to continue to monitor the trend as fuel prices escalate.

Number of persons per trip

There was a tendency for the proportion of one person trips to increase between 1972 and 1977. This probably reflects the National trend in formation of one-person households. However, if the trend continues it has implications for the lodging and restaurant industries, among others. In 1977, slightly over 50 percent of the trips in the region were taken by individuals.

Type of lodging

There was an increase in the proportion of commercial lodging (hotels, motels and campgrounds) used as well as stays with friends and relatives. Therefore, the use of the travelers own lodging (second homes, etc.) declined.

Distance traveled

Between 1972 and 1977, there was an increased proportion of travel for round trips of 400 miles or less and conversely the share of longer trips diminished. By 1977, slightly over 50 percent of the trips taken were for the shorter distances and slightly less than half for distances over 400 miles.

Limitations

Analyses of National Travel Survey data are subject to certain limitations. The Travel Survey only includes trips which are 100 miles or more each way. Therefore, a major portion of trips by travelers in New England or individual small states, such as Delaware, may go unreported. This would be especially true for travel to resource based attractions - mountains, lakes or seashores - which are relatively close to the traveler's home. The Travel Survey reports fewer trips per capita taken by New England residents compared to those residing in other regions, Table 5. Part of the discrepancy may be due to the exclusion of shorter trips.

Table 5. Trips per capita and per traveling person, by region, and for the U.S., 1977.a/

Region	Trips per Capita	Trips per traveling person
New England	1.9	3.4
NY-NJ	1.7	3.4
Mid-Atlantic	2.2	3.8
South	2.4	3.8
North Central	2.7	4.0
Northwest	3.8	4.8
Southwest	3.1	4.4
Pacific	2.8	4.1
United States	2.5	4.0

a/ Source: U. S. Department of Commerce, Bureau of the Census, 1977 National Travel Survey.

If there is a trend towards taking shorter trips, the under-reporting problem may increase. A lowering of the minimum trip length may be warranted in future travel surveys.

The impact of Canadian travel to the U.S., particularly Northern New England, also cannot be measured. Thus, if the

number of Canadian travelers is increasing over time this may partially offset the negative effect of fewer American travelers.

SUMMARY AND CONCLUSIONS

The major purpose of this paper was to demonstrate the use of National Travel Survey data for 1972 and 1977 in a modified shift-share analysis of travel in the Northeastern states together with population growth between 1970 and 1977. Additional comparisons of travel data also were made to detect possible trends or changes in travel patterns.

The Northeast had the greatest negative population share index compared to other regions and the U.S. Four Northeast states lost population between 1970 and 1977.

Low or negative population growth influenced person nights of travel in the region between 1972 and 1977. Consequently, the Northeast also had the greatest negative travel share index value. Other regions of the U.S. lost out as a travel destination relative to the National pattern, also. For example, the Pacific region had a negative index value as well. A camper travel index using person nights of travel with camping equipment was generated. In this instance the Northeast had the largest positive index value, because camper travel increased relative to the U.S. and other regions.

The Northeast tends to be highly dependent on persons residing within the region as the source of travelers. Continued slow or non-existent population growth in the region will have the effect of limiting the growth in demand for travel, especially when the impact of rising fuel costs is considered.

Other trends noted include a slight increase in: (1) the proportion of trips taken for entertainment purposes, (2) the use of public transportation, (3) the use of commercial lodging, and (4) the tendency to take shorter trips of less than 200 miles one way.

The analysis has developed some possible indicators of change in travel in the Northeastern U.S. It will be necessary to examine other secondary sources at the county level or to collect primary data to provide the causes of the changes noted.

LITERATURE CITED

Dunn, Edgar S., Jr. 1960. A statistical and analytical technique for regional analysis. Papers and proceedings, Vol. 6, The Regional Science Assoc.

U. S. Department of Commerce. Bureau of the Census. 1972 and 1977. National travel survey, Census of Transportation.

U. S. Department of Commerce. 1978. Statistical abstract of the United States.

Appendix A. Travel Regions of the 1972 National Travel Survey

TRENDS IN ALLAGASH WILDERNESS WATERWAY USES IN THE 1970's[1]

Thomas J. Cieslinski, Supervisor
Planning and Research
Bureau of Parks and Recreation
Augusta, Maine

The Allagash Wilderness Waterway is a 92-mile long river and lake corridor through the forests of northern Maine. It begins at Telos Dam at the eastern end of Telos Lake, extends westward to Allagash Stream and Allagash Lake in T8 R14, and northward through Chamberlain Lake, Eagle Lake, and Churchill Lake to the beginning of the river itself at Churchill Dam. The northern half of the Waterway, which is essentially river, includes a fine stretch of whitewater at Chase Rapids and forty foot Allagash Falls.

Passage of the Allagash Waterway Act in 1966 established the framework for protection of the river corridor by the State Bureau of Parks and Recreation. Companion legislation led to the approval by the people of Maine in referendum, of monies for the acquisition of a land corridor in average 500 feet wide from the high water mark; the State-owned area contains 22,760 acres of shore land and approximately 30,000 acres of submerged land. The Waterway legislation also gave to the State the power to approve timber harvesting operations on all private land within one-mile from the river's edge.

Road access to the Waterway is largely over private lumber company roads; primary access routes are from Millinocket, Greenville, Ashland, and Allagash Village. The visitor can also gain access by water; most commonly into Eagle Lake via Indian Stream from Indian Pond, Allagash Lake by Johnson Pond and Stream, and Mud Pond by portage trail from the West Branch Penobscot watershed. Access by float plane is allowed at designated sites.

The Allagash has a rich and diverse history from the use of the land by native Indians, to logging operations, to the visits of Henry David Thoreau in the mid-1800's, to use of the river for sport fishing, thru the early protection efforts of the United States government and the State of Maine. In July, 1970, the Allagash was designated as the first State administered component of the National Wild and Scenic Rivers Act of 1968.

The Allagash is now staffed by a supervisor with assistance from several year-round and seasonal rangers, who are responsible for maintaining approximately 72 campsites for summer use. The area also receives increasing snowmobiling and ice fishing use in the winter, but exact visitor counts are not available as such users are not required to register.

VISITOR USE IN THE 1970's

Presented in Table 1 is a history of public use of the Allagash from 1966 through 1977. Total use flucuated from a low of just under 26,000 visitor days[2] in 1968 to a high of over 50,000 visitor days in 1973. However, the number of parties and number of persons has generally increased annually since 1966 with highs of over 2,600 parties and 9,700 persons in 1978. A decreasing average length of stay and a decreasing party size are the primary reasons for less total visitor days than might be expected. Persons per party peaked in 1972 at 5.23 while average length of stay was highest in 1968 and 1970 at 6.85 and 6.83 days respectively.

Factors Influencing Use

Though the Allagash became State administered in 1966, annual visitor use remained about the same through the 1969 season. In July, 1970, the Allagash was officially designated, in a ceremony at Churchill Dam, as the

[1] Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2] Defined here as 24 visitor hours, which may be aggregated continuously, intermittently, or simultaneously by one or more persons. Total visitor days is the product of number of visitor times average length of stay.

first State administered federal wild and scenic river. This designation, with subsequent national publicity, appeared to generate a steady increase in use from 1970 through 1973. In 1974, the first gasoline shortages were felt in the United States. Subsequent spot shortages and a major shortage again in 1979, may have been factors in decreasing use from 1974 through 1976 and maintenance of a fairly constant level of use from 1977 through 1979.

Table 1
Allagash Visitation Data Summary[a]

Calendar Year	Number Parties	Number Persons	Persons Per Party	Average Length Stay (days)	Total Visitor Days
1966	1,011	4,141	4.10	6.52	27,008
1967	1,065	4,539	4.26	5.91	26,831
1968	884	3,786	4.28	6.85	25,921
1969	1,134	4,820	4.25	6.17	29,720
1970	1,251	5,460	4.36	6.83	37,301
1971	1,492	6,345	4.25	5.72	36,274
1972	1,579	8,260	5.23	5.20	42,952
1973	1,877	8,337	4.44	6.04	50,361
1974	1,684	7,477	4.44	6.06	45,294
1975	2,400	9,447	3.94	4.60	43,503
1976	2,356	8,619	3.66	4.74	40,834
1977	2,489	9,278	3.73	5.04	46,766
1978	2,664	9,734	3.65	4.82	46,882
1979	2,392	8,932	3.73	4.97	44,357

[a]No data available prior to 1966. Does not include winter use data.

Gasoline availability is not the only factor influencing use. Summer weather patterns can cause a fluctuation in use from year to year as can the publication of feature articles in national magazines. In an effort to maintain or reduce use levels, the Bureau of Parks and Recreation requested, in the early 1970's, that use of the Allagash Waterway not be promoted by State agencies. This request has been honored, but some publicity still occurs through private sector promotion.

The Bureau has instituted two other measures that help control use. A group size restriction of no more than 12 persons per party was instituted in 1974 and a fee system of $1.00 a night for residents and $2.00 a night for non-residents (children under 15 free) was instituted in 1975. The fee system was also instituted to help defray operation and maintenance costs.

By instituting these measures, the Bureau hopes to avoid the necessity of a reservation system to keep visitation at acceptable levels during the peak months of July and August. Efforts will continue to spread use equally among designated sites and throughout the visitation season. Oversized groups of 13 persons or more (commercial guides utilizing the Waterway for three consecutive years before the 1974 regulation went into effect are still allowed to guide oversized parties) are generally required to utilize certain designated group campsites (which are off the general route of travel) to lessen impact on smaller parties.

Results of Visitor Surveys

Three surveys of visitors have been conducted in the Allagash:

- a 1966 survey by the Bureau of Forestry;
- a 1973 survey of all 1,877 parties using the Waterway in that year by the Bureau of Parks and Recreation; and
- a 1978 survey of 1,309 parties (about 50 percent of those using the Waterway) by the Bureau of Parks and Recreation.

A summary of major trends is presented in Table 2. 1966 results are not directly comparable because the questions were asked and worded differently.

Table 2
Allagash Use Trends

	1966[a]	1973	1978
Maine Parties - percent of total parties	63	48	51
Fishing Parties - percent of total parties	72	33	30
Canoe Parties - percent of total parties	25	23	27
Parties taking thru trip (to Allagash Village) - percent of total parties	18	30	39
Fishing Parties - percent Maine led	-	78	81
Canoe Parties - percent Maine led	-	20	28
Visitor day impact of parties of 12 or more persons - percent of total visitor days	-	30	15
Percent of parties visiting Allagash Lake	4	5	5

[a]1966 questions were phrased and administered differently than those asked in 1973 and in 1978.

Parties originating in Maine constitute about 50 percent of all parties visiting the Allagash. There appears to be a trend towards increasing visitation by Maine residents, despite a slight decrease in fishing and a slight increase in canoeing (canoeing parties tend to be led by out-of-state residents). However, the percent of Maine led canoeing and fishing parties are both increasing.

The primary purpose of visitation is closely correlated to the month of visitation. Fishing is by far the primary purpose of parties visiting the Allagash in May while canoeing is the primary purpose of August visitors. The majority of July visitors are there for the combined purpose of fishing and canoeing.

Parties of 13 or more accounted for 30

percent of the total visitor day impact in 1973. Today, primarily because of the group size restriction imposed, they account for only 15 percent of the impact. This percentage should decline over the years as commercial guides, excepted when the 1974 restriction was imposed, eventually cease to guide parties in the Allagash.

The primary destination of the majority of Allagash parties is Allagash Village. Fishing parties seek the large lakes, however, especially Eagle Lake, while day use parties frequent the Michaud Farm area. Canoeing parties are most likely to pursue the through trip to the Allagash Village area.

The major entry point of Waterway parties is Chamberlain Bridge, followed by Telos Landing and Indian Stream. In 1978, 2.4 percent of all parties entered the Waterway from the West Branch Penobscot watershed; the majority of these entered via the Mud Pond portage to Mud Pond. In 1973, about 1.9 percent of the parties entered from the West Branch Penobscot watershed.

THE ALLAGASH IN THE 1980's

Will concern with the potential of overuse of the Allagash continue into the 1980's? The answer to this question will probably be very dependent upon the continued availability of an adequate supply of gasoline for automobile travel, the continued popularity of wilderness oriented canoeing, and whether or not the Dickey-Lincoln reservoir is constructed. Gasoline shortage and rising prices are predicted to continue. That in itself may be enough to forstall the need for additional considerations, such as a reservation system, to control use in the Allagash.

Can the opportunities and experiences offered the Allagash user be enhanced? A general concept plan was completed for the Allagash in 1973. That document addressed and presented recommendations relating to routes of access, the control of bridges, use and location of control stations, user regulations, the location and maintenance of campsites, historical interpretation, the management of sporting camps in the Waterway, safety and rules enforcement, information and publications, staffing, and forest resource management. The 1978 user survey found, for instance, that the tramway was one of the most popular points of interest in the Waterway. The 1973 plan recommended that the tramway area and the locomotives in the area be restored, maintained, and interpreted for increased user enjoyment. The Bureau has investigated this possibility and will pursue greater interpretation. Restoration and maintenance appear to be uneconomical.

Other recommendations from the 1973 plan, and from the 1973 and 1978 surveys, which might enhance user enjoyment include continuing to limit the number of bridge crossings to no more than are now present and to locate them in such a manner as to reduce the visual impact of logging traffic; continuing to encourage the use of biodegradable containers and packaging by visitors and a carry-in, carry-out policy; continuing group size restrictions to protect both the wilderness character of the Waterway and the social impact on smaller parties; rotation of overused campsites to allow ground vegetation to recover; continued restrictions on size and use of outboard motors; continued management of Nugents Sporting Camp on Chamberlain Lake as long as it maintains its present character; management of the land bordering the Waterway in a natural state except as otherwise specified in the Waterway Act; the provision of a few additional campsites in certain overused areas to meet present demand (primarily the Churchill Lake/Dam area and Allagash Falls area); and the provision of a central camping/staging facility in the Telos Lake/Chamberlain Bridge area if present overnight use demands continue or increase.

Some of these recommendations can be implemented without increased staffing or budgeting. Others will require additional monies which are difficult to obtain at this time. If needs are pressing, these monies will be sought. It is likely, however, that in the 1980's emphasis will be on implementation of management recommendations to increase use enjoyment, rather than recommendations requiring additional funding.

A continued concern in the 1980's will be the management of Allagash Lake as a remote wilderness area. Allagash Lake has primarily been used for fishing. A special 1979 survey of Allagash Lake users indicated that almost 82 percent of the visitor days incurred at the Lake were by fishing parties. Over 52 percent of the users entered the Lake via Johnson Pond/Stream while almost 25 percent came up by Allagash Stream and almost 14 percent entered using the Allagash Carry Trail.

The Bureau of Parks and Recreation is cooperating with the Department of Inland Fisheries and Wildlife to determine fishing pressures on the Lake. These studies will continue until Fish and Wildlife can determine what measures need to be taken, if any, to maintain or enhance the fisheries of Allagash Lake. Continuation of the remote, wilderness characteristics of Allagash Lake will be a major objective in the 1980's.

ASSESSING CHANGES IN THE IMPORTANCE OF TOURISM IN THE NORTHEAST[1]

Tommy L. Brown
Department of Natural Resources
Cornell University

INTRODUCTION

It is widely acknowledged that tourism is a vital component of the economy of counties and states in the Northeast, as well as in other regions of the US. Nearly all states claim tourism as one of their three largest industries. Yet data which accurately measure tourism and its economic impacts are woefully lacking.

A number of data sources serve as useful indicators of tourism levels. Visits to state and national parks and other recreation areas, out of state hunting and fishing license sales, and boat registrations are examples. These data are useful indicators of levels of travel, but they provide little information on the economic impacts of tourism.

In response to the gasoline shortages and increased prices that first began in 1973-74, a federally funded regional research project of the Northeast Agricultural Experiment Stations, NE 100: "Recreation Marketing Adjustments in the Northeast", was formed. This project had as its objectives the examination of changes in recreation activity patterns by households in the Northeast, and the impacts of changes in recreation/travel patterns on subregional economies. This paper examines the indicators of economic change related to tourism that are derivable from secondary data sources.

EVALUATION OF SECONDARY DATA SOURCES

Data sources useful to this effort had two requirements: comparable economic data by states and substate units throughout the Northeast, and data for at least two time periods. Because of differences in the collection and reporting of employment and sales data by state labor and tax departments in the Northeast, these potential data sources were not acceptable for this effort. National data sources were then examined. Three data sources, all published by Bureau of the Census, proved potentially useful to the study: The Census of Retail Trade and the Census of Selected Services, published in 1972 and 1977, and County Business Patterns, published annually.

Each of these data sources reports the number and size of firms by Standard Industrial Classification (SIC) codes. The Census of Selected Services includes lodging data and other amusement and recreation services (e.g., movies, bowling alleys, race tracks), while the Census of Retail Trade includes such sectors important to tourism as sporting goods stores and bicycle shops, eating and drinking places, and gasoline service stations. County Business Patterns reports all of the above sectors. The Censuses of Retail Trade and Selected Services are more complete in their coverage, in that they utilize Internal Revenue Service and Social Security Administration data on small firms, including those with no employees. County Business Patterns, on the other hand, restricts its coverage to employment covered by the Social Security Program, excluding the self-employed.

Censuses of Selected Services and Retail Trade provide data on the number of firms, annual sales or receipts, and number of paid employees for the week of March 12. Obviously March 12 is a poor time choice for assessing impacts of tourism. County Business Patterns has provided annual payroll data only since 1974. Number of establishments and number of employees the week of March 12 have been provided annually since 1964. However, due to changes in data collection procedures, paid employee data is not comparable prior to 1974.

The difficulty in utilizing these data sources to evaluate the changing importance of tourism is reflected in the categories in which the data are reported, and in the inherent

[1]Presented at the Recreation Trends Symposium, Durham, New Hampshire, April 21-23, 1980.

difficulty in measuring tourism. With the exception of the lodging sector, the clientele of other retail firms serving tourists also serve local residents. Moreover, the proportion of sales to local residents is often in excess of that to tourists. As a result, differences in tourism-related sales by a given restaurant or sporting goods store from year to year can easily be masked by changes in sales to local residents, if the latter trends in the opposite direction from the former. The author has experienced this problem in studies of the impact of salmon fishing in New York (Brown, 1975).

Kahn (1975) correctly points out that the lodging sector is not exclusively tourism-oriented in that restaurant facilities and meeting rooms receive local as well as tourist trade. However, unlike such major tourism sectors as restaurants and service stations, the majority of the volume in the lodging sector is tourism-derived. This is particularly the case in rural areas, which is the focus of the NE-100 study.

As a result of the above problems, it is the author's conclusion that comparisons of lodging statistics provide the best indication of changes or differences in economic impacts of tourism. This is in contrast to the use of many sectors in an analysis of factors affecting regional employment in tourism by Ellerbrock and Hite (1980). It is justified, however, by the preceding discussion, plus the interrelated observations that (1) travel of any notable economic consequence to the destination community involves overnight lodging, and (2) overnight lodging is often the largest expenditure component of tourists at the travel destination. Therefore, this analysis is limited to an analysis of changes in the lodging sector in the Northeast.

Of the available lodging measures, the number of firms is the least valid trend measure. The replacement of several small firms by a few larger firms may give the erroneous impression that tourism has declined over time. The number of employees is a moderately sensitive measure, but due to the collection of data during the week of March 12, it has limited utility. Annual sales/receipts is the most sensitive measure of changes or differences in lodging-related tourism, and is therefore the primary measure used in this paper.

METHODS

In comparing the importance of tourism to several areas over a specified time period, two types of measures are useful. The first is a comparative measure of the relative importance of tourism to the economies of the areas served and an indication of whether the economies being compared are growing more dependent, or less dependent, on tourism on a relative basis. The second useful measure is a quantitative comparison among study areas of the magnitude of the industry, the relative change in the magnitude of the industry over time, and factors which relate to differences in growth rates.

A comparative measure of the relative importance of tourism to the economies of states and counties in the Northeast was achieved by developing location quotients for all states, and for counties in which secondary data were available. Described in some detail by Isard (1976), location quotients (LQs) can be developed for employment, income, sales, or other economic parameters. LQs compare the proportion of a smaller area's economy devoted to a particular sector to the analagous proportion for a larger geographic area, of which the smaller area is a component part. In comparing a lodging receipts LQ of a county with its state, for example, an LQ of 1.0 indicates that the proportion of the county's total receipts or sales derived from lodging is the same as that for the state. If the LQ were 2.0, the proportion of all county receipts derived from lodging would be twice that of the state.

For this analysis, lodging receipts LQs were developed comparing first states in the Northeast and then counties in the Northeast to the Northeast as a region of the U.S. In developing the LQs, the broader economic measure to which the lodging sector is compared had to be chosen. The measure chosen was the total of receipts from all service sectors of the economy as represented by Bureau of the Census' Census of Selected Services. An alternative measure would have been the sum of receipts and sales for the service sector plus the retail trade sector.

The quantitative comparison between states and counties was facilitated by using shift-share analysis. This technique has been described in detail by Dunn (1960) and Ashby (1964). It has previously been applied to employment data, but is equally valid when used with sales or receipts. After examining lodging receipts for 1972 and 1977, the net relative change is calculated for states and counties in the Northeast. The large number of counties in the Northeast makes further aspects of shift-share analysis impractical. At the state level, however, further analysis is undertaken to gain indicators of the degree to which changes in lodging are attributable to regional growth, industrial mix or distribution of industries, and proportional share of total lodging receipts. These concepts are further explained in the analysis.

1972-1977 STATE LEVEL LODGING ANALYSIS

Location Quotients

From Table 1, it is apparent that the Northern New England states of Vermont, Maine, and New Hampshire are tourism-dependent states, compared to the remainder of the Northeast. The proportion of the total service receipts (lodging, personal, business, automotive, other repair, amusement/recreation, dental, legal, and engineering/architectural/surveying services) of these states derived from tourism range from 2.54 (New Hampshire) to 3.88 (Vermont) times that of the Northeast as a whole in 1977. West Virginia and the District of Columbia are also notably above the average for the Northeast. Connecticut, New York, and New Jersey, on the other hand, are least dependent on tourism on a relative basis.

The 1977/1972 LQs in Table 1 provide an indication of whether states have become more dependent or less dependent on lodging, on a relative basis, during the 1972 to 1977 period. New York and the District of Columbia have increased their relative dependence on tourism by approximately 10 percent, while at the other extreme, Maine, Vermont, Connecticut and Massachusetts have grown less dependent on tourism by approximately 12 to 14 percent. Again, these are relative measures. The fact that a state has become less dependent on lodging on a relative basis may simply mean that other sectors of the economy have expanded.

Table 1. Location Quotient of States for Lodging Receipts with Respect to the Entire Service Ecomony of the Northeast, 1972, 1977, and 1977/1972.

STATE	1977	1972	1977/1972
Connecticut	0.72	0.83	0.87
Delaware	1.13	1.08	1.04
District of Columbia	1.65	1.52	1.09
Maine	2.96	3.45	0.86
Maryland	0.85	0.81	1.04
Massachusetts	0.96	1.08	0.88
New Hampshire	2.54	3.14	0.81
New Jersey	0.86	1.02	0.84
New York	0.83	0.76	1.10
Pennsylvania	1.16	1.29	0.90
Rhode Island	0.93	0.97	0.96
Vermont	3.88	4.48	0.87
West Virginia	1.66	1.82	0.91

Derived from Census of Selected Services, U.S. Bureau of the Census, 1972 and Census of Service Industries, U.S. Bureau of the Census, 1977.

Shift-Share Analysis

To facilitate the shift-share analysis, 1977 receipts were converted to 1972 constant dollars. Since inflation rates differ for various economic sectors and in various sections of the United States, an approximation of inflation for the lodging sector in the Northeast was obtained by maintaining a constant ratio of dollar receipts per lodging employee for the two years under comparison. This resulted in a 5-year inflation estimate of 40.4 percent, compared to the national estimate of 43.7 percent for the same period.

To a large degree, the absolute magnitude of the lodging industry in the Northeastern states is a reflection of the size of those states. New York, Pennsylvania, New Jersey, and Massachusetts were the leading states in total lodging receipts in both 1972 and 1977. From Table 2, Column 8, it is apparent, however, that the greatest relative growth in lodging occurred elsewhere. The southern portion of the region (Delaware, Maryland, West Virginia, and the District of Columbia) experienced real growth in excess of 20 percent from 1972 to 1977. Maine's percentage growth of 12.6 percent was above the regional average of 6.7 percent, but New Hampshire and Vermont experienced real growth of less than three percent. Real growth in lodging was positive in every state in the Northeast from 1972 to 1977, but was least in New York and New Jersey, where it was less than one percent.

Columns (3), (4), and (5) of Table 2 allow further perspectives of the growth in the lodging sector from 1972 to 1977. From 1972 to 1977, in constant dollars, the Northeast retail economy declined by 2.34 percent in the level of sales and receipts. Column 3 indicates the change in lodging receipts each state would have experienced had lodging receipts grown (in this case, declined) as the rest of the economy. Lodging thus was one of the growth industries during this five year period of slight recession.

The industrial mix component (Column 4 of Table 2) is a measure of the mix and growth of the lodging industry in the region compared to other industries in the regional economy. It is calculated by multiplying 1972 receipts of each state by the difference in percentage change of the lodging industry and the entire retail economy of the Northeast from 1972 to 1977. Since the lodging sector of the Northeast increased by 6.7 percent and the regional economy declined by 2.3 percent, each state's 1972 lodging receipts totals are multiplied by the factor 9.0 percent, yielding a positive industrial mix for each state. Column 9 of Table 2 proportions the lodging industry mix among the states.

The state shares component (Column 5 of Table 2) is sometimes referred to as the

Table 2. Shift-Share Analysis for Lodging Receipts in the Northeastern United States, 1972 to 1977.

State	1977 Receipts	1972 Receipts	Changes Related to: Regional Growth	Industrial mix	State Shares	Total Change	Net Relative Change
	(Measured in Millions of 1972 Constant Dollars)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Connecticut	87.8	81.1	-1.9	7.3	1.3	6.7	8.6
Delaware	23.9	19.4	-0.5	1.8	3.2	4.4	4.9
District of Columbia	158.1	123.2	-2.9	11.1	26.7	34.9	37.8
Maine	81.2	72.1	-1.7	6.5	4.2	9.1	10.7
Maryland	147.8	121.9	-2.9	11.0	17.8	25.9	28.7
Massachusetts	249.8	236.8	-5.5	21.3	-2.8	13.0	18.5
New Hampshire	72.2	70.3	-1.6	6.3	-2.8	1.9	3.6
New Jersey	278.3	277.6	-6.5	25.0	-17.8	0.8	7.2
New York	922.3	918.2	-21.5	82.8	-57.1	4.1	25.6
Pennsylvania	507.3	456.9	-10.7	41.1	20.0	50.5	61.1
Rhode Island	25.7	23.2	-0.5	2.1	1.0	2.5	3.1
Vermont	60.3	59.0	-1.4	5.3	-2.6	1.3	2.7
West Virginia	70.9	58.0	-1.4	5.2	9.0	12.9	14.3
Northeast Region	2,685.6	2,518.7	-58.9	226.9	0	168.0	226.9

Percentage Changes, 1972 to 1977

	Percent Real Change	Percent Industrial Shift	Percent State Share Shift
	(8)	(9)	(10)
Connecticut	8.2	3.2	1.5
Delaware	22.9	0.8	3.8
District of Columbia	28.4	4.9	32.2
Maine	12.6	2.9	5.1
Maryland	21.2	4.8	21.4
Massachusetts	5.5	9.4	-3.4
New Hampshire	2.7	2.8	-3.3
New Jersey	0.3	11.0	-21.4
New York	0.5	36.5	-68.7
Pennsylvania	11.0	18.1	24.0
Rhode Island	10.9	0.9	1.2
Vermont	2.3	2.3	-3.1
West Virginia	22.3	2.3	10.9
Northeast Region	6.7	(99.9)	(100.1)(-99.9)

regional component (in national research) or the proportionality component. It is a measure of the degree to which each state has increased or decreased its "share" of regional lodging receipts. It is calculated by multiplying each state's 1972 lodging receipts totals by the difference in percentage change of the state's increase and the region's increase in lodging receipts from 1972 to 1977. In constant dollars the District of Columbia, Pennsylvania, and Maryland were the big gainers, while New York was the big loser. These state shifts are shown as a percentage of total positive and negative shift in Column 10 of Table 2. Three-fourths of all positive state shifts were accounted for by the three gaining states cited above, while 86 percent of the negative shifts were absorbed by New York and New Jersey.

The total change in lodging receipts from 1972 to 1977 (the sum of Columns 4 and 5) is shown in Column 6 of Table 2. This is also simply the difference between 1972 and 1977 lodging receipts, in constant dollars. Again, all states experienced positive growth, ranging from $0.8 million in New Jersey to $50.5 million in Pennsylvania (in 1972 constant dollars).

The net relative change (Column 7 of Table 2) is the difference between the total change and the regional growth (Columns 3, 4, and 5). Since the regional growth of the Northeast economy was negative from 1972 to 1977, net relative change data exceed total change data in magnitude.

1972-77 COUNTY LEVEL ANAYLSIS

Based on county-level data from the 1972 and 1977 Census of Selected Services, location quotients (LQs) were calculated as previously explained for lodging receipts, comparing the proportion of counties' lodging receipts vs. total service sector receipts to that of the Northeast region. These data were then mapped.

It should be pointed out that while LQs revolve around an index base of 1.0, an average of all county lodging receipts LQs is considerably above 1.0 (it was 2.39 in 1977). This is true for several reasons. First, the lower bound on an LQ is 0, while there is no mathematically dictated upper bound. Secondly, the large cities of the Northeast, which control a large proportion of the total regional economy, consistently have LQs of considerably less than 1.0, which increases the LQs of counties with smaller economies. Finally, the counties for which lodging data are not available are primarily those which do not have a developed tourist economy; thus the average for counties having available LQs is increased somewhat.

Approximately 30 counties in the Northeast had LQs of greater than 5.0. Many of these counties are in areas of the Northeast traditionally known to be tourism areas - coastal areas of Maine, the White Mountains of New Hampshire, the Adirondacks and Catskills of New York, Cape Cod, Nantucket, and Martha's Vineyard in Massachusetts, Cape May in New Jersey, the southern Maryland coast, the Pocono Mountains of Pennsylvania, and the Allegheny Mountains of West Virginia. Scattered counties elsewhere in Pennsylvania and Vermont also have lodging receipts LQs of greater than 5.0 (Figure 1).

If we examine counties in the Northeast with lodging LQs of greater than 2.0, the dependence of the northern portion of the region on tourism becomes obvious. Virtually all of Northern New England and Northern New York fall within this grouping. Numerous counties appear in the rest of the region as well, particularly in the lightly populated coastal areas.

Figure 2 shows the 1977/72 LQs for the Northeast. Scattered counties which had high 1977 LQs increased their relative dependence on tourism from 1972 to 1977. A number of other rural counties showed a relative increase in the lodging sector as a proportion of total services of 10 percent or more.

Indications of absolute change in lodging receipts in constant dollars from 1972 to 1977 can be obtained from Figure 3. Receipts in many traditional tourist areas increased by better than 10 percent, some by more than 25 percent. Lodging receipts also increased by greater than 10 percent in some nontraditional areas, such as the Buffalo, New York area. Lodging receipts declined in real dollars, however, for many Northeastern counties from 1972 to 1977. A disproportionate share of these counties are located in Massachusetts, but these counties are interspersed throughout the entire region.

SUMMARY

One of the great frustrations of tourism analysts has been the lack of availability of trend data. This problem still exists, although the Census of Selected Services' measure of annual lodging receipts is an important indicator of tourism at the state and county level. This data source would be greatly improved if the 1982 survey avoided the disclosure problems that resulted in so much missing data at the county level in 1972 and 1977. There are very few counties in the Northeast which have so few lodging facilities that lodging summary statistics at the county level would provide implications as to the size of a particular firm.

This study has been largely devoted to evaluating secondary data sources and methods for analyzing secondary tourism data. The delineation of states and counties in the Northeast which are highly dependent on tourism, or which have experienced changes in the levels of tourism receipts, and the quantification of those parameters have provided an initial step in improving our understanding of tourism in the Northeast. Further analysis is needed to explain the tourism patterns described in this study. A new Northeastern regional project has been proposed to State Experiment Station directors which, if funded, would continue this analysis.

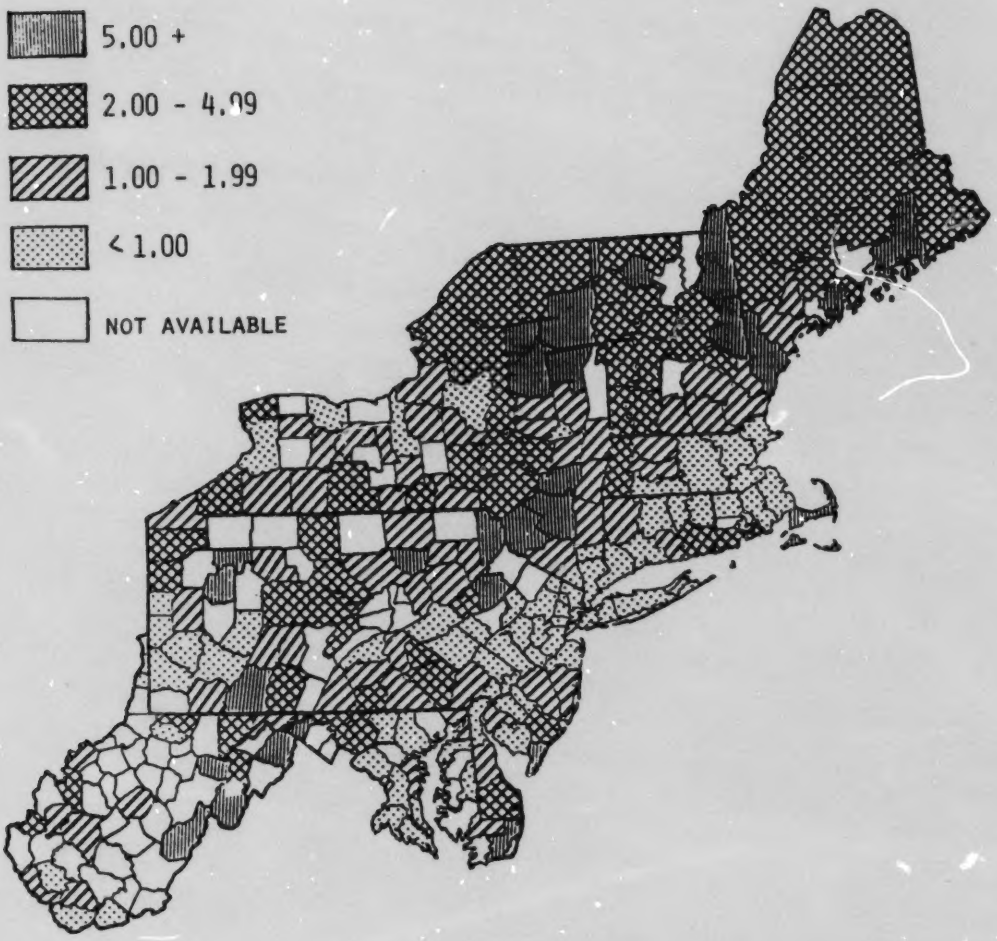


FIG. 1. 1977 LOCATION QUOTIENTS FOR LODGING RECEIPTS FOR COUNTIES IN THE NORTHEAST.

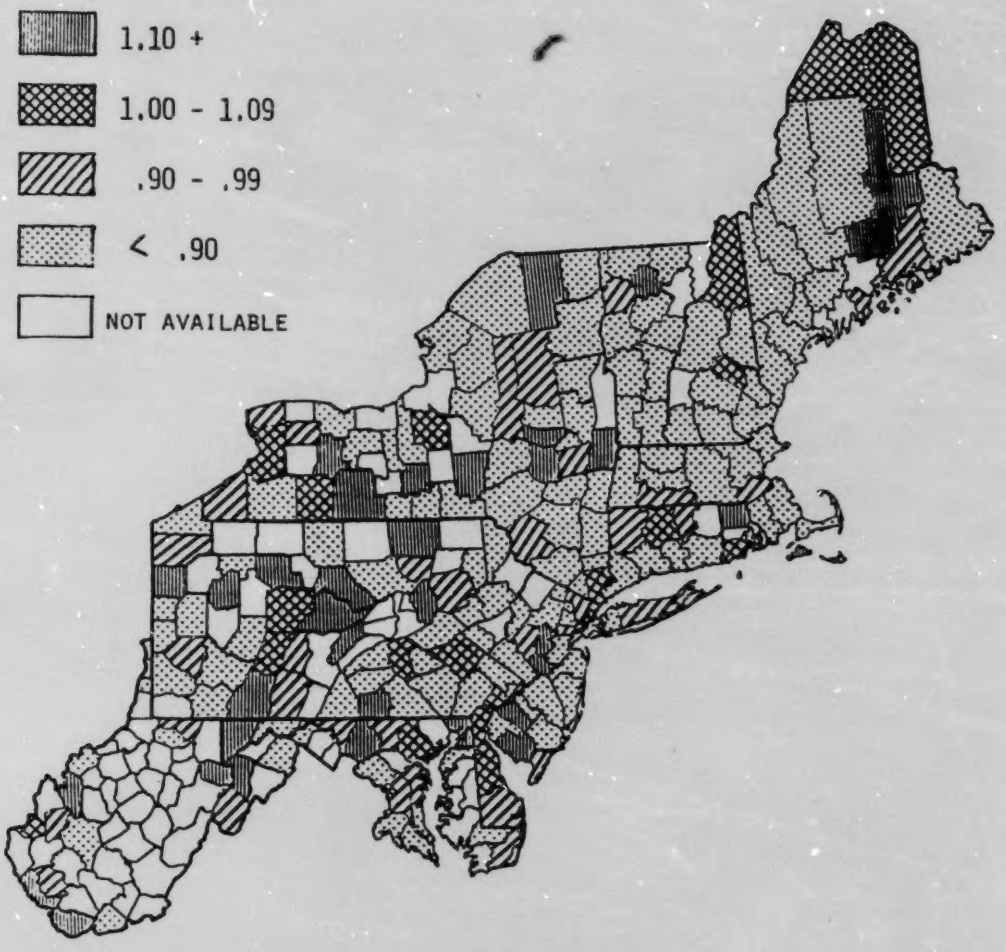


FIG. 2. 1977/1972 LOCATION QUOTIENTS FOR LODGING RECEIPTS FOR COUNTIES IN THE NORTHEAST.

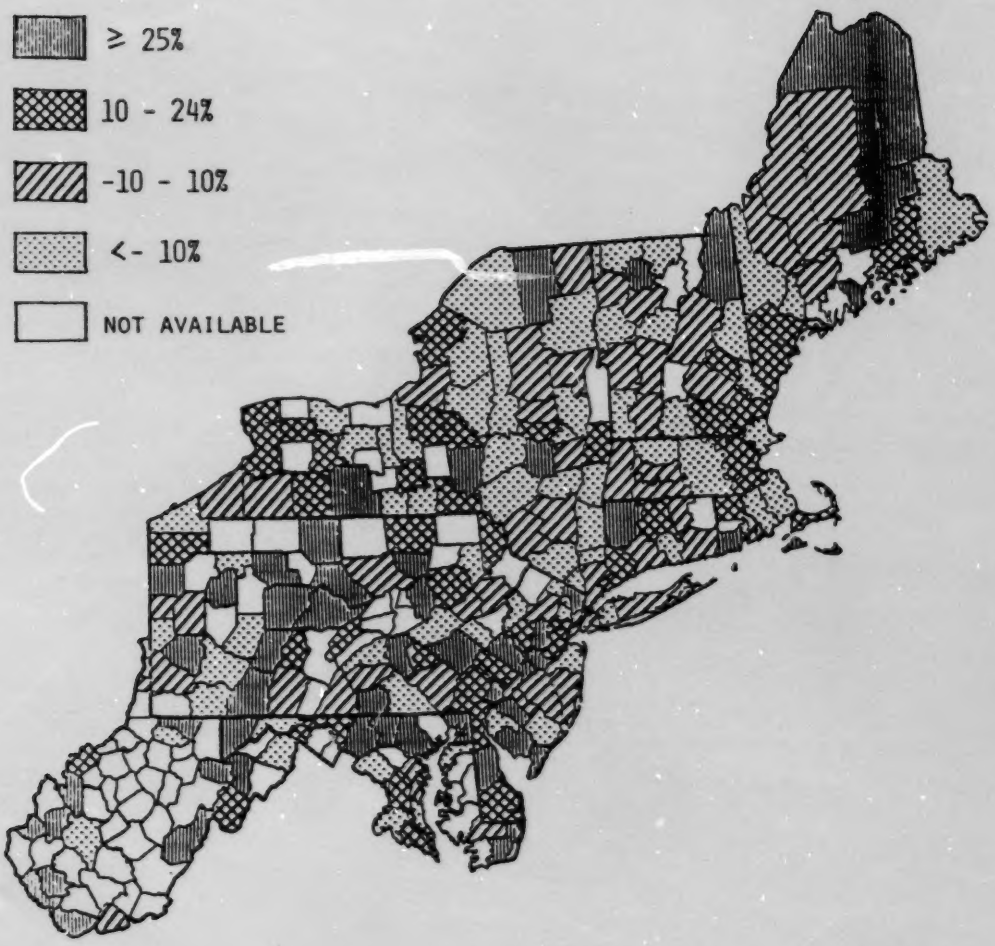


FIG. 3. NET PERCENTAGE CHANGE IN LODGING RECEIPTS FOR COUNTIES IN THE NORTHEAST, 1972 TO 1977.

LITERATURE CITED

Ashby, L.D., 1964. The Geographical Redistribution of Employment: An Examination of the Elements of Change, Survey of Current Business. U.S. Dept. of Commerce, Office of Business Economics, October, p. 13-20.

Brown, T.L., 1975. The 1973 Salmonid Run. New York's Salmon River Sport Fishery, Angler Activity, and Economic Impact. New York Sea Grant Institute publication NYSSG-RS-75-024. 26pp.

Dunn, E.S. Jr., 1960. A Statistical and Analytical Technique for Regional Analysis. Papers and Proceedings of the Regional Science Association, Vol. 6, 97-112.

Ellerbrock, M.J. and J.C. Hite, 1980. Factors Affecting Regional Employment in Tourism in the United States. Journal of Travel Research, Winter, 26-31.

Isard, W., 1976. Methods of Regional Analysis. The M.I.T. Press, Cambridge, Mass., Tenth Printing, 784pp.

Kahn, T.D., 1975. Estimating Tourist Industry Employment: The Primary Data Approach. Sixth Annual Travel Research Association Conference Proceedings, 167-174.

U.S. Bureau of the Census, 1972. Census of Selected Services. U.S. Government Printing Office.

U.S. Bureau of the Census, 1977. Census of Service Industries. U.S. Government Printing Office.

A METHOD FOR EXPLAINING TRENDS IN RIVER RECREATION DEMAND

George L. Peterson[1]
David W. Lime[2]
Dorothy H. Anderson[3]

Abstract.--Data being collected by The National River Recreation Study (NRRS) (U.S. Forest Service, St. Paul) includes origin-destination information for recreational visits to a variety of rivers nationwide. Such data are being collected over several years during a time of rapidly changing energy costs, economic conditions and consumer attitudes. This presents an opportunity to explain trends in river recreation demand. Methods of site choice and site demand analysis may be useful for this purpose. Appropriate mathematical models are defined and explained. It is shown how these models can be used to explain demand and predict trends.

INTRODUCTION

The primary thesis of this paper is that while it is useful and necessary to describe and project recreation trends, it is more powerful and efficient if they can be explained and predicted.

To describe a trend is to observe it and draw a picture of it - How have things changed in the past and what changes are occurring now? To project a trend into the future is to assume a kind of uniformitarianism - that the future will march to the same drummer as the past - that the river of time on which we paddle our frail canoes has no surprises around the bend.

We are advised by voyageurs of old who paddled the Great Lakes in birchbark canoes, "If you do not wish to drown, stay close to the shore." This is good advice in planning and in paddling, but there are times when it is more efficient to cut across the bay. There are also gorges like that of the Churchill river as it flows toward Hudson Bay where, for miles on end, there is little chance of rescue or escape in the event of an upset. And, sometimes we are committed to such gorges or shortcuts before the "signs of the times" warn us of possible dangers ahead.

The strategy of watching the winds and currents of now and staying close to shore has saved many a voyageur (and many a government official). But, armed with a good map of the river and a scientific forecast of the weather, we can proceed somewhat more boldly, effectively and efficiently.

In our management of recreation resources, we cannot literally scout the rapids ahead. But, we can do some kinds of research that will allow contingency scouting. To explain a trend is to explain the data of the past and present by means of theories about the processes causing changes to occur. Such theories and models can be powerful aids to judgment.

A "trend" is "the general course or prevailing tendency or drift" of something over time. In the recreation business, public and private investors are concerned about trends in recreation demand, particularly when those trends affect the consequences of lumpy capital investments or major commitments of natural resources. Failure to recognize trends in demand may cause today's "unwise" decisions to become tomorrow's foolishness. This is particularly unfortunate when such foolishness cannot easily be undone.

[1]Professor, Department of Civil Engineering, Northwestern University, Evanston, IL 60201

[2]Research Social Scientist, USDA Forest Service, North Central Forest Experiment Station St. Paul, MN

[3]Geographer, USDA Forest Service, North Central Forest Experiment Station, St. Paul, MN.

It is therefore understandable that so much effort goes into the description and projection of trends. But, it is better, if the trends can be explained in terms of their underlying causes. It then becomes possible to make conditional predictions, to analyze sensitivities, and, perhaps, even to control the trend rather than to chase it. The information revealed by trend explanation often leads to a double strategy which includes both modification of underlying causes of the trends and treatment of the symptoms of the trend itself.

The purpose of this paper is to discuss methods for explaining trends in river recreation. Emphasis is on the use of rivers for recreational travel by canoe, kayak, raft, innertube, etc., including the increasingly popular whitewater float trip. The framework used is generalizable, however. This kind of recreation has been increasing remarkably in recent years to the point that rationing and allocation schemes are being considered or implemented in some places. (Shelby, 1979)

The impact of increasing demand for free-flowing rivers has been complicated by another more basic trend: increasing demand for other uses of the river and its adjacent lands. The competing demands include domestic water supply, hydroelectric power, flood water retention, irrigation, industrial and manufacturing uses of water, waste disposal, and land development. Because of difficulties in demonstrating the benefits of recreation and because these competing demands for water are clearly linked to income, employment and economic development, they tend to get higher priority. This has created a trend of contracting quantity and quality of supply.

A reactionary trend based in public sentiment and political activism emerged in the late 60's and early 70's to produce 1) legislation such as the Wilderness Act, The Wild and Scenic Rivers Act, The National Environmental Policy Act, and the Wild and Endangered Species Act, 2) numerous ad hoc political skirmishes aimed at legislative preservation of specific free-flowing streams, and 3) a presidential call for examination of the stream-flow requirements of recreation (Carter, J. 1978).

In the midst of this exciting and perplexing ferment of contradictory demands and trends, the 1970's introduced two profound intervening factors: energy shortage and two-digit inflation, possibly leading to shrinkage of real income. Gasoline prices have quadrupled in five years. What affects are these changes having on the quantity, geographic distribution, and social distribution of demand for river recreation? What new trends, if any, are developing, and what can be predicted for the future? Can the changes reveal useful information about the demand process so that resources can be managed more effectively and future changes anticipated?

The National River Recreation Study (NRRS) being conducted by the North Central Forest Experiment Station (Lime, et. al. 1979) may be able to help answer such questions. Beginning in 1977 data have been collected so far on the recreational use of 39 different rivers nationwide, including origin and destination data on travel to and from the rivers. Some of the rivers have been monitored for two and three years, thus providing the possibility of analysis of trends.

Theoretical Framework

A useful theoretical framework can be developed from the following assumptions:

1. The set of rivers (j=1,2,---,r) represents the nationwide spectrum of river recreation opportunities.

2. For person n residing at location i the utility or net benefit produced by a visit to river j is

$$ {}_nU(ij) = {}_nu(X_{1ij}, X_{2ij}, ---, X_{gij}, ---, X_{pij}) + {}_n\epsilon_{ij} \qquad (1) $$

Where x_{gij} is the magnitude of variable g experienced by person n during a visit to river j. The x's may include travel cost, site use fees, river characteristics which influence the suitability of the site for the purpose in question (deBettencourt, 1979). ${}_nu$ is the systematic or predictable function by which utility is sensitive to x. The residual ${}_n\epsilon_{ij}$ is random "error" and is assumed to be independently and identically distributed for all rivers according to the Weibull distribution with dispersion parameter λ. (McFadden, 1978)

3. Interpersonal and inter-situational differences in ${}_nu$ can be captured effectively by a set of market segments or person types. To simplify the discussion, notation designating person or person type will be dropped. The utility function will be designated simply by

$$ U(ij) = u(x_{1ij}, x_{2ij}, ---, X_{gij}, ---, x_{pij}) + \epsilon_{ij} \qquad (2) $$

with the understanding that it may vary by market segment. The utility function may vary also by activity or purpose of visit (e.g., kayaking, canoeing, rafting), but for simplicity it may be assumed only one activity is considered.

4. When a person engages in the recreational activity in question, that river is chosen which maximizes utility.

Based on these assumptions and given participation in the specified activity, the probability that a person residing at location i will choose river j is

$$\hat{P}(j|i) = \frac{e^{\lambda U(ij)}}{\sum_{k=1}^{r} e^{\lambda U(ik)}}. \qquad (3)$$

This is a logit choice model (Domencich & McFadden, 1975). It can be estimated by maximum likelihood methods if the form of the utility function is specified and data are available on individual choices and the magnitudes of the x's experienced.

This kind of model is generally called a "site-choice" or "trip-distribution" model. It explains the proportion of total demand each site will receive, but it does not explain the magnitude of demand. The number of visits delivered by location i to river j is

$$V_{ij} = P(j|i) \sum_{k=1}^{r} V_{ik} = \frac{e^{\lambda U(ij)}}{\sum_{k=1}^{r} e^{\lambda U(ik)}} \sum_{k=1}^{r} V_{ik}, \qquad (4)$$

Where $\sum_{k=1}^{r} V_{ik}$ is the total number of visits from location i to all rivers. In order to explain the magnitude of site demand, it is thus necessary to explain $\sum_{k=1}^{r} V_{ik}$. This is a "trip-generation" problem.

There are several ways trip-generation might be approached (Stopher & Meyburg, 1975). One way is to use a simple empirical model of the type proposed by Cesario and Knetsch (1976). Assume location i is a geographic area containing a finite number of people P_i, of the type in question. Assume also that the average number of river trips per person is a function of the total supply of opportunities. The denominator of the trip distribution logit model (3) measures the condition of supply from the point of view of i. A plausible hypothesis is

$$\mathcal{E}(\text{River trips per person}) = \frac{\sum_{k=1}^{r} V_{ik}}{P_i} = b_o \left[\sum_{k=1}^{r} e^{\lambda U(ik)}\right]^{b_1} \qquad (5)$$

$$\text{or} \quad \sum_{k=1}^{r} V_{ik} = b_o P_i \left[\sum_{k=1}^{r} e^{\lambda U(ik)}\right]^{b_1}. \qquad (6)$$

Given this relationship, the site demand function becomes

$$V_{ij} = \frac{e^{\lambda U(ij)}}{\sum_{k=1}^{r} e^{\lambda U(ik)}} b_o P_i \left[\sum_{k=1}^{r} e^{\lambda U(ik)}\right]^{b_1}. \qquad (7)$$

An alternative approach which is conceptually more general is the nested choice model (McFadden, 1978). The choice process might be decomposable into several conditional demand allocation stages: 1) choice of recreation site given recreation activity, 2) choice of recreation activity given that time is allocated to recreation, and so on. If the utility function is separable by site variables, activity variables, etc., a logit model can be derived which explains $P(j,\beta,---)$, the probability of choosing site i and activity β and --- etc. Activity variables might include "psychological outcomes" (Driver and Brown, 1975) as used by Peterson et. al., (1978) to explain activity choice. However, for use in prediction, even a two-stage model requires knowledge of all sites for all activities. In all but very simple cases of two or three choices in each stage, the model becomes impossibly complex and data hungry. With simplifying assumptions, it might be feasible to develop a model of this type which requires specific knowledge of site attributes only for river recreation. This is a subject for another paper, however. The approach used here is based on equation (7), with the understanding that more powerful models may be possible.

The Single River Case

Equation (7) shows the demand for one river to be a function of the characteristics of all rivers with which the river competes. Consider the special case of a river with no competitors. This situation might exist, for example, when the users of a particular river include a subgroup of people whose choice set contains only that river. Some rivers, such as the Colorado River in Grand Canyon National Park and the Middle Fork of the Salmon River in Idaho may be so unique they compete with other rivers only in the sense they compete with movies or trips to Europe. A certain river may have local geographic monopoly such that virtually all the visitors use that and only that river for the activity in question. Or, we may choose to perform the analysis, given the choice of this river. In any case, the assumption of no competitors implies the parameters, models, and conclusions apply only to that river and cannot be generalized to other situations, because none comparable exist. With this understood, there are no dangers in single site analysis. For the single river case, equation (7) becomes

$$V_i = b_o P_i \, e^{b_1 \lambda U(i)} \qquad (8)$$

In general, the parameters of a single-site model such as equation (8) should not be estimated for one site and applied to another. Equation (8) derives from the assumption the rivers in question are not competitors. This may imply different utility functions and/or mutually exclusive populations for different rivers.

It is interesting to compare (8) with (7). Equation 7 can be stated as

$$V_{ij} = \left[\sum_{k=1}^{r} e^{\lambda U(ik)}\right]^{(b_1-1)} b_o P_i \, e^{\lambda U(ij)} \qquad (9)$$

or

$$V_{ij} = \gamma_i b_o P_i e^{\lambda U(ij)} = b_o P_i \, e^{[\ell n \gamma_i + \lambda U(ij)]} \qquad (10)$$

where γ_i is a function of the condition of total supply from the point of view of i. This comparison reveals an interesting conclusion. Even if b_o, b_1, P_i and U are universal for all rivers, substitutes or not, the single-site model (8) multiplies the utility function by b_1, the trip-generation exponent, while the multiple-site model (10) adds to the utility function an origin-specific supply function. Estimating equation (8) for one river and then applying the results to another river is an implicit assumption that $[\ell n \gamma_i + \lambda U(ij)] = b_1 \lambda U(ij)$. While this may be true under very restrictive conditions, in general the single site model clearly does not reveal generalizable information about sensitivity of demand to changes in variables in the utility function such as changes in fuel costs and site variables. While such an empirical model can explain demand and participation trends for a given river, it cannot explain or predict such trends under conditions different than those under which the data were observed. The magnitudes of the estimated "constant" parameters will change with changes in the variables.

On the other hand, using the multiple site model (7) or (10) for several non-substitutable rivers also has serious problems. As in (9) the market population from which each river draws its visitors may be different and/or the utility functions may be different. Such problems can distort the results seriously and lead to invalid conclusions if they are not recognized.

Thus, ability to predict changes in participation at specific sites requires for each river correct knowledge of a) the consumer utility function and b) the market population. If, for a given set of rivers, utility "errors" are identically and independently distributed over the market populations by the normal or Weibull distribution about a common utility function, equation (7) is an explanatory site demand function. If a river has no substitutes, equation (8) is an explanatory site demand function, but is not generalizable to other rivers.

Simple Illustrative Models

For illustrative purposes assume the predictable portion of the utility function contains only two variables,

D_{ij} = travel distance from location i to river j

A_j = a measure of the site quality at river j

The functional form most often used in logit models is the simple linear combination:

$$u = bo + b_1 A_j + b_2 D_{ij} \qquad (11)$$

This function assumes a constant marginal rate of substitution, which may be reasonable for narrow ranges of variation although it does not allow estimation of the dispersion parameter λ. From the point of view of economic theory, a more general form is

$$u = \alpha A_j^{\beta_1} D_{ij}^{\beta_2}. \qquad (12)$$

Another form with properties similar to (12) is

$$u = \ell n \, \alpha + \beta_1 \, \ell n \, A_j + \beta_2 \, \ell n \, D_{ij}. \qquad (13)$$

This form produces convenient algebraic simplification of the logit model. Equations (12) and (13) are appealing because they show diminishing marginal returns, but none of these forms is satisfactory when the marginal utility function is not single valued. For example, the attractiveness of a river for white-water canoeing is low for sluggish streams. As the white-water difficulty increases, attractiveness increases to a point and then begins to decrease again as the river becomes too difficult. Perhaps this is because the variable is a composite of several more basic variables, but, in general, it has proven useful to represent such relationships by a quadratic utility function (deFettencourt, 1979):

$$u = \alpha + \beta_1 A_j^2 + \beta_2 A_j D_{ij} + \beta_3 D_{ij}^2. \qquad (14)$$

Apparently there has not been much research done on the problem of specifying the best utility function in logit models or site-demand models. Most logit modellers seem satisfied by the assumption of (11), perhaps because utility is difficult to measure and the models robust. In any case, more research is needed on utility functions. At least the robustness of the models over different utility

function forms needs to be studied.

To illustrate the kinds of information revealed for trend and impact analysis, assume the utility function has the form of (13) and distance is the only variable. The multiple site-demand model (7) is

$$V_{ij} = \frac{D_{ij}^{\lambda\beta}}{\sum_{k=1}^{r} D_{ik}^{\lambda\beta}} b_o(\alpha^{\lambda b_1}) P_i \left[\sum_{k=1}^{r} D_{ik}^{\lambda\beta}\right]^{b_1} \quad (15)$$

The single-site demand model (8) becomes

$$V_i = b_o P_i \alpha^{\lambda b_1} D_i^{\lambda b_1 \beta}. \quad (16)$$

In estimation, the parameters cannot be decomposed and the two models are

$$V_{ij} = \frac{D_{ij}^{B_1}}{\sum_{k=1}^{r} D_{ik}^{B_1}} B_o P_i \left[\sum_{k=1}^{r} D_{ik}^{B_1}\right]^{b_1} \quad (17)$$

and

$$V_i = B_o P_i D_i^C, \quad (18)$$

where B_o, B_1, b_1, and c are estimated parameters.

Given the assumptions and the multiple-site case (equation 17), the parameter B_1 describes the sensitivity of demand distribution to distance. The parameter b_1 describes the sensitivity of demand to the overall condition of supply. In the single-site case, C describes demand sensitivity to distance, but it is not generalizable to other sites.

Response of demand to changes in things like site attractiveness and fuel cost cannot be analyzed in (17) or (18). Changes in fuel cost would change the meaning of distance and would cause changes in B_1 and C. The impacts of changes in fuel price and other economic conditions would be better analyzed if D_{ij} were replaced by variables describing travel time, travel mode, fuel price, etc. The resulting equations would be more general and would explain the response of demand to changes in these variables. Likewise, variables describing the specific site attributes to which site attractiveness is sensitive should be included in the utility function. This would explain the response of demand to specific changes at specific sites.

Illustrative Empirical Applications

Using only distance and population, the authors used a model based on the log-linear utility function, equation (13), to do single-site analysis for the Boundary Waters Canoe Area Wilderness in Minnesota. Under the assumption of no substitutes, the purpose was to estimate

$$V_i = B_o P_i D_i^C \quad (19)$$

for several different camping types of wilderness travelers: paddle canoeing, motor canoeing, motor boating, hiking, cross-country skiing, and snowmobiling. The purpose of the study was to describe the relative uniqueness of the site for different activity purposes by describing the geographic origins of visitors.

In order to eliminate biases resulting from possible differences in sampling rates, the equation was estimated in the following form:

$$P(ni) = P(i)P(n|i) = \alpha D_i^C e^{e_i} \quad (20)$$

where $P(i)$ = the probability that a visit randomly observed at the site is from origin i,

$P(n|i)$ = the probability that a visit randomly observed at the site is person n from origin i, given that the visit is from origin i and assuming all persons at origin i are equally likely to visit the site.

$P(ni)$ = the joint probability that a visit observed randomly at the site is person n from origin i, assuming all persons from origin i are equally likely to visit the site.

e_i = an error or residual that is assumed to be independently and normally distributed with constant variance over the range of analysis.

Estimates of these probabilities are

$$\hat{P}(i) = \frac{V_i}{\sum V_h},$$

$$\hat{P}(n|i) = \frac{1}{P_i}$$

$$\hat{P}(ni) = \frac{V_i}{P_i \Sigma V_h} .$$

Because equation (20) is a probability, its complete specification in the estimated form is

$$\hat{P}(ni) = \frac{D_i^c}{\Sigma P_h D_h^c} . \qquad (21)$$

This equation can be estimated by maximum likelihood methods. However, the simpler method of ordinary least squares applied to the log-linear form of equation (20) was used. The results are shown in Table 1.

Using National River Recreation Study data from 1977, Peterson, Lime, and Anderson (1979) estimated similar single-site equations for twelve rivers. The results are shown in Table 2.

With NRRS data for twelve rivers studied in 1978, (Ergün and Peterson 1980) estimated the following site choice model:

$$P(j/i) = \frac{e^{\beta D_{ij} + \zeta_j D_j}}{\sum_{k=1}^{r} e^{\beta D_{ik} + \zeta_j d_k}} . \qquad (22)$$

This logit model is based on the linear utility function

$$u = \beta D_{ij} + \zeta_j d_j \qquad (23)$$

Table 1
Single site Analysis for Six Uses of the Boundary Waters Canoe Area Wilderness
(Assuming no substitute sites for the respective activities)
(1974 - 1977)

Activity	Estimated Equation P(ni) =	Number of Trips in Sample	Number of Zones	Log-Linear R^2	Adjusted Log-Linear R^2
Paddle Canoeing	$(0.03)D_i^{-2.54}$	68,283	167	0.774	0.773
Motor Canoeing	$(0.16)D_i^{-2.86}$	10,195	119	0.745	0.743
Motor Boating	$(0.10)D_i^{-2.87}$	14,278	152	0.713	0.711
Hiking	$(0.19)D_i^{-2.93}$	2,483	62	0.813	0.810
Cross Country Skiing	$(4.13)D_i^{-3.47}$	365	14	0.816	0.801
Snowmobiling	$(64.31)D_i^{-4.13}$	422	12	0.907	0.900

Table 2
Single-Site Analysis for Twelve Rivers
(1977 Data)

River	Estimated Equation P(ni) =	Number of Trips in Samples	Number of Zones (i)	R^2	Adjusted R^2
Main Salmon	$(0.00096)D_i^{-1.78}$	175	27	0.735	0.724
Middle Fk. Salmon	$(0.0014)D_i^{-1.81}$	191	28	0.702	0.691
Upper Colorado	$(0.00083)D_i^{-2.02}$	2169	52	0.795	0.791
Apple	$(0.00067)D_i^{-2.03}$	191	26	0.753	0.743
Nantahala	$(0.0011)D_i^{-2.08}$	87	26	0.697	0.684
Chattooga	$(0.0012)D_i^{-2.26}$	9877	77	0.728	0.724
Illinois	$(0.0023)D_i^{-2.27}$	226	22	0.789	0.778
DesChutes	$(0.012)D_i^{-2.48}$	456	18	0.797	0.784
Ocoee	$(0.0061)D_i^{-2.61}$	280	23	0.875	0.869
Mohican	$(0.0028)D_i^{-2.64}$	444	21	0.837	0.828
Hiwassee	$(0.035)D_i^{-2.87}$	128	12	0.858	0.844
Upper Missouri	$(1.26)D_i^{-3.03}$	497	32	0.911	0.908

where d_j is a site-specific dummy variable which takes on the value of one for river j and zero for all other rivers,

ζ_i is an estimated site-specific parameter capturing sampling and specification errors, including biases resulting from different sampling rates at different rivers.

β is the estimated marginal utility of distance.

The analysis was based on 4524 visits to the twelve rivers from 377 three-digit zip-code zones. The estimate of β in equation 22 is -.00167. The results clearly show distance to be an important explainer of demand distribution. A simple market share model correctly predicts 20.9% of the trips. With the addition of distance to the model, this rises to 50.7%. Assignment of equal probabilities on the basis of no information whatever gives 8.3% correctly predicted. However, Ergün also found that β varies for the twelve rivers from region to region when the model is estimated on a regional basis. He also divided the twelve rivers into two basic types and found differences in β by river type. This indicates the presence of effects not adequately captured by equation (21).

Discussion of the Empirical Results

Results presented in the preceding section are illustrative only. The equations are estimated under very restrictive assumptions. The estimation procedure, while simple, does not satisfy the condition that the probabilities must sum to one over all cases, which may introduce slight biases in the exponents and major biases in the coefficients. The coefficients should, in any case, be regarded with skepticism because of their extreme sensitivity to errors in estimation.

The most interesting bit of information is the exponent of distance. Given the hypothesized functional form (20), the exponent c is the distance elasticity of trip attraction. If the equation is constrained as in (21) the elasticity is $c[1 - P(ni)]$. However, P(ni) is likely to be an extremely small number except in the unlikely situation where the origin is very

close to the destination, there are few nearby origins, and the population is very small. In any case the probability will always be less than the reciprocal of the population. The elasticity estimates the percent change in P(ni) when distance changes by one percent. Assuming that any estimation biases affect all equations in the same systematic way, comparison of the exponents between equations reveals relative differences in elasticity. It does not, however, reveal reasons for the differences.

While attempting to interpret the results, it is important to recall the assumptions under which the illustrative equations were estimated, especially:

1. The distance-decay of trip attraction is insensitive to conditions of competing supply,

2. There are no differences in site quality,

3. The population from which a site attracts its visitors is homogeneous vis-a-vis the systematic or predictable portion of the utility function, and inter-personal differences are randomly, independently, and identically distributed by the Weibull distribution, and

4. The market population is the entire population of the contiguous United States.

With these assumptions in mind, the estimated elasticities lead to the following comments and conclusions:

1. Trip attraction is very sensitive to distance and is strongly explained by distance alone.

2. On the average, the explained portion of log-linear variation among zones is about the same for the BWCAW (79%) as it is for the rivers (78%). There is little variation among all the equations in the amount of variance explained. There is apparently no cause to conclude that the model is more applicable in some cases than in others.

3. The distance elasticity varies among rivers and among different uses of the BWCA. This implies some "market areas" are more local than others, for whatever reason. Generally, the more elastic the demand, the more local the resource. It is interesting that the BWCA shows very different elasticities for different uses, which suggests that a site may be geographically more unique for some purposes than for others, i.e., it tends to reach out farther for some kinds of visitors than for others.

4. Because distance is closely related to travel cost and travel time, given travel mode, it should be possible to estimate models which explain the sensitivity of site demand to these variables. This will allow prediction of the response of demand at specific sites to changes in fuel cost and transportation technology, other things being equal.

5. It is not clear from the empirical results what the reasons are for the differences in exponents. Plausible causes are

a) differences in the benefit of an activity to its participants,

b) differences in the quality of a site for the given activity,

c) differences in the quality, quantity and relative location of competing sites and activities, and

d) differences in participation costs.

It is clear that differences exist. Further experiments are needed to isolate the causes so that demand can be understood and predicted and resources wisely allocated.

6. Although details are not reported here, examination of the residuals shows non-random geographic patterns (Peterson, Lime & Anderson, 1979). This implies other variables may be influencing the relationships systematically and their effects may be predictable, although the magnitude of their effects is less than the effect of distance.

The distance elasticity of trip distribution in equation (23) is $\beta D_i [1 - P(j|i)]$ where $\beta = -0.00167$. This is not comparable with the trip attraction elasticity, because they are different concepts and the utility function specifications differ. It is interesting to note, however, that when $P(j|i)$ is small, the distance elasticity of trip distribution has the range of -1.78 to -4.13 when distance has the range of 1066 miles to 2473 miles.

More important, though, is that the estimate of β is not stable when rivers are segmented by type and the population is segmented by area. This could be caused by incorrect specification of the utility function and/or aggregation error.

REFERENCES

Carter, J. (President), Water Policy Reform Message, July 6, 1978.

deBettencourt, J.S., "Threshold Theory and Methods for Assessing Environmental Performance Capability," Ph.D. dissertation, Northwestern University, Evanston, IL., 1979.

Domeneich, J. and D. McFadden, Urban Travel Demand: A Behavioral Analysis, North Holland Publishing Co., New York, 1975.

Driver, B.L. and P.J.Brown, "A Social-Psychological Definition of Recreation Demand," in Assessing Demand for Outdoor Recreation, USDOI-BOR and NAS, Washington, D.C., 1975.

Ergün, G. and G.L.Peterson, "River Site Choice Modelling," Northwestern University, Evanston, IL., 1980.

Lime, D.W., R.C. Knopf and G.L.Peterson, "The National River Recreation Study," 2nd Conference on Research in The National Parks, Nov. 26-30, San Francisco, 1979.

McFadden, Daniel, "Modelling the Choice of Residential Location," in A. Karlquist et. al., (eds.) Spatial Interaction Theory and Planning Models, North Holland Publishing Co., New York, 1978.

Peterson, G.L., A.Anas, F.S. Koppelman, P.R. Stopher, Prediction of Urban Recreation Demand, Northwestern University, Evanston, IL, 1978.

Peterson, G.L., D.W. Lime and D.H.Anderson, "Attraction of Recreationists to Rivers: A Nationwide View," 2nd Conference on Research in the National Parks, Nov. 26-30, San Francisco, 1979.

Shelby, B. and M. Danley,"Allocating River Use," Oregon State University, 1979.

Stopher, P.R. and A.H.Mayburg, Urban Transportation Modelling and Planning, Lexington Books, Lexington, MA. 1975.

TRENDS IN RECREATIONAL VEHICLE TRAFFIC IN NORTHEASTERN MINNESOTA[1]

Arthur Norton
Lake Superior Basin Studies Center
University of Minnesota, Duluth
Duluth, MN

Karen Noyce
Lake Superior Basin Studies Center
University of Minnesota, Duluth
Duluth, MN

Thomas J. Wood
Lake Superior Basin Studies Center
University of Minnesota, Duluth
Duluth, MN

INTRODUCTION

Many northeastern Minnesota communities depend upon outdoor recreation activities and tourism for a substantial portion of their yearly cash inflow. While the recreation and tourism industry in the region has grown steady in recent years, it may prove to be less stable in the future than other industries, for at least two basic reasons: (1) while sociologists and recreation planners may dispute the assertion, outdoor recreation is considered by many a luxury or a non-essential activity and therefore subject to alteration of activity participation due to changing economic status of families and individuals. (2) the recreation and tourism industry is dependent to a large part on a highly mobile population. Because of these two characteristics, recreation and tourism patterns can be subject to rapidly changing trends as a result of inflation, increasing energy costs and gasoline availability.

To respond to data needs of program planners and decision makers within the recreation and tourism industry, a recreational vehicle traffic monitoring program was implemented to determine if an easily conducted, standardized count of traffic could adequately describe patterns of recreational oriented movement in and out of the Duluth area. The moniter was designed to identify: vehicles that were most common; movement of boats, canoes, dirt bikes, skies, snowmobiles etc; periods of high and low volumes; and changing patterns of movement.

In addition to the traffic monitor, existing supplemental data was expected to aid in determining the effect that external factors had on levels and patterns of recreational activity. While temperature, weather, season, events, and holidays were to be examined as potential impacts, the overiding concern of many people in the industry focused on spiraling gasoline prices and the potential of nonavailability of gasoline supplies.

Studies and theories concerning recreational traffic and response to gasoline restrictions both in Canada and Europe have been conducted by Dr. R. I. Wolf (1969,1977). Unavailability of fuel is thought to be a more potent force in restraining travel than its rising cost but there is little research that can support this contention. Wolf has found that there appears to be a change in travel patterns in Europe as a result of the continuing escalation in fuel costs or in its restricted availability. Europeans are turning toward public transportation to provide for their required travel to and from work and their social obligations, but reserve their private auto for travel to their recreational second home or their favorite recreation area. Will Minnesotans and their visiting neighbors respond similarly? This is what we wanted to know.

STUDY AREA

Duluth is located at the western tip of Lake Superior in northern Minnesota. It is a center of recreation for northern Minnesota

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

and Wisconsin in its own right, but virtue of its beautiful harbor, adjacent Lake Superior, long ocean-like beach, cultural and retail opportunities and transportation linkages.

Expansion and new development of recreation opportunities is evident in Duluth. The Marine Museum, one of the most visited attractions in Minnesota, was expanded in 1978-1979. Cleanup of the picturesque and largely undeveloped St. Louis River which flows through the city has already begun; a new, advanced, waste-water treatment plant located on the river started operations in the fall of 1978. Several new hiking trails planned for 1980 are in some of Duluth's 110 city parks.

The recreation-tourism industry is a very important segment of Duluth's economy. Uel Blank reported that during 1972, visitors traveling through Duluth typically made expenditures equal to 28 percent of the city's total retail sales for a summer week. A yearly projection of non-resident vehicles had Duluth-Superior as their major destination and survey data indicated a conservative estimate of 3.8 million non-resident person-trips to Duluth-Superior for vacation purposes alone each year.

Duluth also serves as a gateway for much of the popular northwoods lake country. It is the largest retail center in the upper Minnesota-Wisconsin region, and thus serves the needs of travelers passing through (and is the destination of many Canadian shopping trips). In addition, the city's geographical position at the head-of-the-lake has led to the intersection of several highways through the city. Backpackers hiking down the main street of Duluth also is a common sight.

Northern Minnesota and Wisconsin have great recreation potential year-round, from fishing in the spring to boating in summer; hunting, fishing, and "leaf-peeping" during autumn; and snowmobiling and skiing in winter. Although summer may always be the busiest tourist season of the year, activity during the other seasons is on the increase. Thompson Hill Visiter's Center had its highest 1978 daily total on September 30th, during the height of the fall foliage season!

PROCEDURES

Interstate 35 south of Duluth was chosen for the traffic counts for two main reasons: first, it brings traffic primarily from the St. Paul-Minneapolis area and further south. Most people vacationing in northern Minnesota come from that direction. Secondly, it has one of the highest volumes of traffic entering Duluth from any direction and the highest percentage of out-of-state recreational traffic (Blank).

Friday afternoons from 1 to 5 p.m. were selected as the optimum counting period for this survey and is assumed to represent the beginning of the weekend recreational traffic period. In addition, Thompson Hill Information Center (located near the observation station) hourly counts indicate that 1-5 p.m. on Fridays is the peak flow period of the week for visitors coming into the area. Counting any later in the afternoon was not possible during the winter months, and week-end traffic counts would have been more expensive and much harder to arrange. In any case, consistency seemed to be the crucial factor in conducting counts throughout the year, since whatever time period selected for counting would only represent a portion of the total weekly recreational traffic.

The traffic count tally sheets were designed to be inclusive of all types of visible recreational traffic and as objective as possible. In some categories there were unavoidable errors, but these were felt to be relatively small and inconsequential. Recreational traffic was classified in two ways. First, counters noted the type of vehicle carrying or pulling recreational equipment, e.g. sedan, pickup, motorhome, four-wheel vehicle, van or other. Second, the type and number of recreational indicators were recorded such as boats, skis, camper-trailers, snowmobiles etc. Recreational equipment was further classified where appropriate, as either "warm-weather" or cold-weather" indicators.

Counting was begun in late July on a test basis. Official counting for this study started August 5, 1977 and ended on July 27, 1979, two complete years of data. Separate counts were kept of northbound and southbound traffic for each hour. At the end of four hours of counting, the totals for each hour in each direction were calculated.

Weather forecasts for each weekend were obtained from the National Weather Service on Friday morning. Any special tourist or recreational-related events occurring that weekend were also noted. Presence or absence of ice on Lake Superior and inland lakes was recorded, as well as the status of hunting and fishing seasons. Supplementary data obtained from other sources were tabulated at the end of the count year. Such data included Thompson Hill Visitor Information Center inquiries, Minnesota Department of Transportation traffic averages, gasoline prices, hotel/motel occupancy rates, Amtrak passenger and recreational baggage totals.

RESULTS AND DISCUSSIONS

This study was initiated in August 1977

and the first year report analyzed data collected between August 1977 and July 1978. The first year report (Norton, Hales, and Flood 1978) demonstrated that a standardized count of recreational traffic can be made that can reflect several trends in both type and volume of recreational travel. Such counts were useful in isolating those events and factors which significantly influence recreational travel patterns. The second year of data was then examined to determine trends, consistantly and impacts of events such as gasoline non-availability in comparison to the first year data.

Treatment of Data

Separate hourly totals of recreational traffic were combined and the four-hour study totals of vehicles were used for most analyses. Analyses included: 1) Seasonal variations in volume of recreational traffic and types of equipment tallied, 2) Comparisons of volume and types of northbound versus southbound recreational traffic, 3) Correlation between patterns of travel revealed by collected data and by other travel indicators, such as Amtrak passenger counts, total traffic volume (as determined by the Minnesota Department of Transportation) and visitor-use data of the Thompson Hill Information Center; 4) Relationships between recreational travel patterns and factors which possibly influence travel such as holidays, special events, hunting and fishing season openings, weather conditions and gasoline price and availability.

For brevity sake, only four factors which were identified to exert significant influence upon recreational traffic will be discussed here: 1) weather, 2) holidays-special events, 3) gasoline price and 4) gasoline availability. A more detailed report on the second year data is in preparation.

Weather Conditions

Weather conditions during 1978-79 were generally similar to those during 1977-78. In both years, the beginning of November was marked by a rapid decrease in temperature, early December was marked by a warm spike, and the spring climb in temperatures was longer and more gradual than the fall decrease. Temperatures started increasing in early March and climbed steadily until early June before leveling off. Major differences between the two years were as follows: 1) There was more snow during 1978-79 than 1977-78. Snow depth climbed steadily to a peak of 30 inches in late February and early March. During 1977-78, maximum average accumulation was only 12 inches by the end of February. 2) 1978-79 was a windier year than 1977-78, particularly during the fall and winter months. 3) Road conditions were more often poor during 1978-79 than during 1977-78, especially during winter. 4) The winter of 1978-79 was colder than that of 1977-78. Temperatures dropped below 32°F two weeks earlier than 1977-78 and did not reach above 32°F again until one week later. Also, there was no January thaw as there had been in 1977-78. 5) The spring was colder and later than in 1977-78. Average temperature stayed below 40°F until mid-May when it suddenly jumped to 50°. In 1977-78, average temperatures had reached 50° by late April and stayed above that temperature from then on.

Holidays and Special Events

Holidays were, of course, the same from one year to the next, as were the openings of hunting and fishing seasons. Types of special events, however, differed somewhat during the two years. Also, they did not always fall at the same time. In some cases a holiday and special event occurred on the same weekend during one year but on different weekends during the other year. This allowed separation of the effects which those two factors had on recreational travel.

Gasoline Prices

During 1977-78, gasoline prices in both Duluth and Minneapolis averaged $.58 to $.62 per gallon. They varied by no more than $.08 per gallon throughout the year. They showed neither a net increase or decrease, but ended the year at approximately the same price as they started the year.

1978-79 was quite a different story. Prices rose approximately $.05/gallon in the first six months of the study-year. During the second six-month period, they jumped another $.28/gallon. This represented a 50% increase in prices between July 1978 and July 1979. Between August and December, Duluth gasoline prices were roughly $.04/gallon higher than Minneapolis prices, as they had been through 1977-78. However, during the period of rapid price increase in the winter and spring, Minneapolis and Duluth prices were similar. By June and July, Duluth gasoline averaged $.02/gallon less than Minneapolis gasoline.

Gasoline Availability

No shortages of gasoline availability occurred or threatened to occur during 1977-78 or during the first 9 months of 1978-79. However, by May 1979, the Minnesota Energy Agency began issuing warnings of upcoming shortage and voluntary cutback in gasoline consumption was urged. During June, gasoline shortages became more and more common until the end of the month, when they were fairly severe in some places. During

July, gasoline supply stabilized somewhat and by the end of the month, threats of more shortages were not so severe.

With these considerations in mind, it is now possible to compare the two years of recreational travel monitoring, with an eye toward identifying causes of differences between the two years.

Patterns of Traffic Flow

Seasonal changes in volume and composition of recreational traffic seen in 1978-79 were very similar to those seen in 1977-78. Bimodal distribution of traffic volume was observed during both years. Fall periods of very low recreational flow began and ended one to two weeks earlier in 1978-79 than in 1977-78, possibly due to the somewhat earlier drop in fall temperatures.

Spring periods of very low flow occurred during the same weeks in the two years. Beginning and end of the cold season, as defined by types of recreational vehicles counted, differed by no more than a week between the two years of observation. The appearance of cold season recreational equipment corresponded closely with the first appearance of snow, which was similar in the two years, rather than with other weather conditions, which varied a little between the two years.

Response to holidays and special events, as indicated by recreational traffic counts, was extremely consistent between the two years. All major holidays brought about the same response in recreational traffic. Special events varied from year to year, but three main events, the Duluth Annual Folk Festival, Fall Foliage Peak and University of Minnesota-Duluth graduation occur yearly. In both years of the study, the weekends of these three events showed large increases in recreational traffic in the north direction. All but the fall foliage peak also brought about a large increase in southbound traffic. During 1978-79, the combined effects of fall foliage peak and the opening of small game hunting may be linked with a decrease in southbound traffic, regardless of the large increase in northbound traffic.

During both years, there was a noticeable trend for special events within the city of Duluth to correspond with slight decreases in southbound traffic, i.e. recreational traffic leaving Duluth. Some examples are Park Point Art Fair, major UMD hockey games during 1977-78, Duluth Days - all-city celebration in 1977-78, Duluth city ski-jumping contest in 1978-79, and the city softball tournament in 1978-79. Essentially these events kept Duluth residents home and off the highway to other places.

Finally, response of recreational traffic volume to hunting season opening weekends was quite similar in the two years. Opening of deer season consistently caused large increases in recreational traffic in both the north and south directions. Opening of small game season corresponded with very low levels of recreational traffic. However, opening weekends of steelhead fishing, smelting and other fishing showed only slight increases in traffic in 1978-79, while in 1977-78, smelting and inland fishing opening weekends were accompanied by large increases. There are at least two possible explanations for this. 1) Since the spring of 1978-79 was much colder and slower in coming to northern Minnesota than the previous spring, the beginning of fishing season was not as desirable a time to be outdoors for many people. Also, inland lakes were frozen much later. The smelt run was slower and more spread out than the previous year, therefore smelting activity would not be likely to bring about as sharp an increase in traffic as the previous year. 2) The price of gasoline was increasing at the sharpest rate during this period of April, May and June of 1978-79. This may have discouraged people from traveling as far as they normally would have for fishing, especially when considered in combination with the cold and wet spring that northern Minnesota was experiencing.

Volume and Composition of Recreational Traffic

Although seasonal trends in relative numbers of vehicles were similar in 1977-78 and 1978-79, there were significant differences in the absolute numbers of recreational vehicles at any given time. During August, September, October and November, recreational traffic volume in the second year was equal to or somewhat lower than the first year. Between December and March, both north and southbound traffic were significantly higher than in the previous year. In April, southbound traffic was much higher, but northbound traffic was 33% lower than in 1977-78. From May on, both north and southbound recreational traffic were lower in the second year than in the first year.

Most likely, the large increase in cold-season recreation can be directly related to the continuous and deep snow cover present in 1978-79. Amtrak records of skis carried during the same time period showed an increase of greater than 200% over 1977-78, which is probably indicative of the same thing. Cold and wet spring weather may account for the increase in southbound traffic and the decrease in northbound traffic during April and perhaps early May. However, by late May, temperatures were once again seasonable and

weather cleared up. It seems likely that the net decreases in recreational traffic during May, June and July may have been due to changes in the price and availability.

A closer look at May, June and July data lends evidence to this suggestion. Table 1 presents the changes which occurred in recreational traffic between 1977-78 and 1978-79 on a weekly basis. It is apparent that early May and late June of the second year experienced the greatest reductions in recreational traffic of 20 to 55% from the previous year. As mentioned previously, low levels in early May may have been due to the unseasonable cold temperatures. However, neither temperature nor other weather factors explain the continued low levels of recreational activity after mid-May. From mid-May to mid-June, recreational travel volume recovered somewhat, however, it remained depressed approximately 10% relative to 1977-78.

TABLE 1: Weekly changes in recreational traffic volume between 1977-78 and 1978-79; May, June, and July

	Total Recreational Traffic 1977-78		1978-79		% Change from 1977-78 to 1978-79	
May	1	158	73		-54	%
	2	185	145		-22	
	3	156	148		- 8	
	4	306	274		-10	
June	1	143	168		+17	
	2	285	250		-11	
	3	247	243		- 2	
	4	247	203		-38	
	5	562	256		-54	
		813		593		-27
July	1	251	337		+34	
	2	362	273		-25	
	3	282	200		-29	
	4	305	275		-10	
Total		3484	2845		-18	%

In late June and the first three weeks of July, volume once again fell to levels 20-50% below those of the previous year. One exception was the first weekend of July, when volume was up by 23%. This is misleading, however since the first July weekend was the 4th of July holiday weekend in 1978-79, while in 1977-78 the last week of June had been the main holiday weekend. The best way to compare this period and eliminate the holiday bias was to lump the two weekend totals. When lumped, overall net change for the two-week holiday period once again showed a substantial reduction of 27% in recreational traffic volume. During the last week of July, traffic volume returned to only 10% below 1977-78 levels.

The factor which seems most likely responsible for the general decrease in recreational traffic between the spring of 1977-78 and the spring of 1978-79 is the high escalation rate of the price of gasoline which occurred during spring of 1978-79. By itself, this factor seemed to account for a decrease of roughly 10%. Other factors in combination with high gasoline prices were capable of further reducing recreational travel to levels 20-50% below 1977-78. These other factors were the unseasonable cold weather in early May and the gasoline shortages in late June and early July. Once gasoline shortages were somewhat ameliorated in late July, travel seemed to have increased back to 10% below 1977-78 levels.

The observed spring decrease in travel was more marked in the northbound direction than the southbound. Average percent change for May through July was -23% for northbound traffic but only -13% for southbound. In 1977-78, northbound traffic between January and July averaged 70% higher than southbound. In 1978-79, it averaged only 8% higher, before January, northbound traffic exceeded southbound by a similar amount of less than 20% in both years. January was the month during which gasoline prices first started to increase after sixteen months of stability. This differential directional effect may have been due to the fact that areas south of Duluth were hit harder by both gasoline price increases and shortages than was the Duluth area. A check with local stations verified this as supplies were available during the entire period.

In addition to the depressive effect which high gasoline prices and low availability had on travel volume, they may have been responsible for changes seen in the mode of travel which people used. Table 2 shows the

TABLE 2: Distribution of carrier types in 1977-78 and 1978-79

Carrier type	1977 - 78		1978 - 79	
SEDAN	45	%	38	%
PICKUP	28		41	
FOUR WHEEL DRIVE	6		6	
MOTORHOME	13		10	
MOTORCYCLE	3		3	
CONVERTED BUS	1		1	
CHARTER BUS	1		1	
OTHER	1		0	
TOTAL	100	%	100	%

relative abundances of different vehicle types during the two years. Motorhomes and sedans showed significant decreases in relative abundance between 1977-78 and 1978-79 while pickups increased. Change in absolute numbers of different types of vehicles are shown in Table 3. Between the first and the second year, motorhomes decreased by 44%, sedans by 29%, 4-wheel drive vehicles by 18%, and other vehicles by 30%. Pickup numbers increased by 23%, despite an overall decrease of 16% in total recreational travel.

TABLE 3: Change in numbers of recreational vehicles from 1977-78 to 1978-79

Type of Carrier	1977-78	1978-79	% Change
Sedans	4063	2871	-29 %
Pickups	2528	3098	+23
4-Wheel Drive	542	453	-18
Motorhome	1354	756	-44
Other	567	378	-30
Total	9019	7556	-16

A drop in the number of motorhomes is understandable in light of gasoline price changes. Motorhomes are typically much less gasoline efficient than other types of vehicles. The shift from sedans to pickups is less understandable. However, gas mileage of large sedans and pickups are comparable. Possibly the shift represents a movement away from vehicles with fairly limited usage to those which are more versatile in their use and utility.

REFERENCES

Blank, Uel, in preparation. Duluth-Superior's Travel/Tourism Economy. University of Minnesota, Agricultural Extension Service, St. Paul, Minnesota.

Norton, A.J., Hales and T. Wood. 1978. Recreational Traffic, Thompson Hill, Technical Report No. 1. Lake Superior Basin Studies Center, University of Minnesota, Duluth.

Wolfe, R.I. 1969. A tentative procedure for estimating recreational highway traffic. Traffic Quarterly, Volume 23, No. 1, pp. 163-177.

_____. 1977. Predicting recreational highway Traffic in Canada at a time of scarcity and high cost of motor fuel. Paper presented at joint meeting of The International Geographical Union and Geography section of the British Association, Birmingham, England. September 3-4, 1977.

SNOWMOBILING IN THE 1980'S:

CONTINUED PROGRESS FOR A MATURE RECREATIONAL ACTIVITY[1]

William T. Jobe, Jr., President
International Snowmobile Industry Association
1800 M Street, Northwest, Suite 850 South
Washington, D. C.

In less than two decades, snowmobiling has changed from a novelty to a way of life for some 20,000,000 Canadian and American citizens of all ages. Why has snowmobiling continued to mushroom? Why did the challenges of inadequate safe use areas, public criticism and skepticism and primitive machines fail to doom the activity to a passing fad?

The answer is two-fold. First, through snowmobiling the unique grandeur of winter outdoors is unlocked for North Americans of all ages and of all levels of physical ability.

The second reason for the success of snowmobiling is "power through partnership". A unique array of imaginative and active individuals in government and industry, concerned enthusiasts and tourism officials together have made snowmobiling an integral part of the lifestyle of North American families.

In spite of poor snow in many areas, this past season has been a time of excitement for those connected with snowmobiling. New friends and supporters of the industry and sport appeared in high government posts, in the major media and in the tourism/leisure sector. This new positive face of snowmobiling stands in stark contrast to the image of the sport in the early 1970's.

A good part of this new image is the direct result of the snowmobile community's ongoing commitment to confronting and dispelling myths connected with the activity and speaking out publicly about snowmobiling and the people who enjoy it. The snowmobile story is being told at public hearings, on radio and television talk shows, in tourism campaigns, in newspaper and magazine articles, through letters to the editor and in face-to-face communications with elected and career government officials.

Today's new and quiet snowmobiles make complaints rare except for instances of operator misuse. As a result, snowmobile sound level concerns are yesterday's problem.

INDUSTRY SALES

The 1978-1979 winter was a notable successful selling season for the snowmobile industry, as retail sales of new snowmobiles climbed to 267,000 units, 18% above the level of the previous year. Key contributing factors included: a new mood of optimism among dealers following the successful 1977-1978 selling season (which saw a 16% sales increase over the winter of 1976-77), an exciting lineup of new snowmobiles in all price categories; good snow conditions in most areas of North America; steady improvements in snowmobile use opportunities; and new positive media treatment. The sales increase was most vigorous in the United States, which saw a 24% jump.

Unfortunately, our sales report for the selling season just concluded is not quite so rosy. Because of a record absence of snow in our prime marketing areas, our sales are below last year. I know this phenomenon of poor snow conditions is one our skiing friends would also like to see disappear forever. The long-term prognosis for snowmobiling is excellent, however.

As we look to a new decade of snowmobiling activity, the snowmobile industry expects that we will see outstanding opportunities. Demographic information and analysis of societal trends lead us to conclude that exciting, novel, flexible and outdoor recreational activities will experience continued growth in the 1980's. Latent interest in the sport participation in snowmobiling is likely to increase substantially over the next five years.

In fact, study after study demonstrates that snowmobiling activity has increased sharply. At the same time, the sport is experiencing a curious decline in visibility in

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

populated snowbelt regions. This reduced visibility of snowmobiles is not the result of decreased activity; rather, it is a consequence of a new trail networks which take snowmobilers to the scenic natural areas they seek and away from populated areas with potential environmental and social conflicts.

SNOWMOBILE TOURISM GROWS

Progress in expanding snowmobile tourism opportunities continues at a fast clip. A fine example of the new prevailing attitude towards winter tourism is found in the theme selected by Minnesota for its promotional campaign last season:

"If God meant for people to vacation in warm climates, why did He make winter in Minnesota so much fun?"

New promotional campaigns featuring snowmobiling are now being mounted in a large number of jurisdictions including Michigan, Manitoba, South Dakota, Minnesota, Pennsylvania, and by the Canadian Government Office of Tourism. The latter's campaign included full color advertisements placed in major North American magazines lengthy, well-written articles which have been picked up across the U.S. and Canada. One of the articles began:

"Canada is a snowmobiler's paradise. From coast to snowy coast, thousands of Canadians and winter visitors are hitting the trails, making this one of Canada's fastest growing sports."

THE FUTURE OF SNOWMOBILING

Two factors central to the long-term health of the snowmobile industry and sport are access to trails and other use areas; and availability of energy.

Land and Trails

If participation in snowmobiling is to increase in the 1980's at a continuing fast rate, all segments of the snowmobile community must continue to coordinate their efforts to expand opportunities for safe and fun outdoor winter activity. The snowmobile community has a stake in countless public land use planning activities as well as federal legislation on such issues as Wilderness. In the latter case, the snowmobile community finds itself, along with a myriad of other recreational groups, sorely neglected. Its interests lie neither with vocal commodity producers nor vocal preservationist interests, yet those two antagonists receive the preponderance of attention from elected officials.

Providing land areas for snowmobiling is but the first step in meeting current and future snowmobiler needs. Just as important is the need to maintain and expand government programs to fund the construction and grooming of snowmobile trails and the construction and maintenance of parking areas, warming shelters, and other facilities that are essential to safe enjoyment of snowmobiling and the growth of the sport.

Acceptance of the desirability of snowmobile trails and responsibility for their creation and maintenance is now evident throughout government agencies in snowbelt North America. Slowly but surely, the traditional view that outdoor recreation ends with the coming of snow is being displaced by a sense that winter offers the opportunity to enjoy unique fun and beauty outdoors. This changed perspective will be extremely helpful over the next decade, and should boost the current total of 90,000 miles of marked and maintained public trails for snowmobilers across North America.

Without appropriate levels of funding, adequate, safe and enjoyable trails cannot exist. Without suitable funding, snowmobile program enforcement and youthful operator training programs cannot aid in assuring that the sport is safe for North American family members of all ages.

To support trail development and maintenance, the snowmobile community has been active in promoting the benefits of a good trails program paid for with snowmobiling-generated revenues. Organized snowmobilers have criticized governments for failing to protect the safety of citizens where there are insufficient safe, well maintained trails and applauded governments that build and groom safe use areas and trails. Tourism professionals with an interest in winter have added a "commercial interest" voice, urging trails and facilities to support their quest for winter tourist dollars. These efforts have worked exceedingly well in expanding spending for snowmobile trails during the past decade.

Yet tight government budgets in the coming decade will pose a challenge to all recreational activities, including snowmobiling. "Earmarking" of funds -- especially snowmobile registration fees and gasoline taxes on snowmobile fuel -- will prove more difficult in the days ahead. Annual campaigns to maintain and boost snowmobile trail program budgets will be increasingly important in the 1980's.

One important factor greatly aiding the

expansion of snowmobile trails is the snowmobile itself. Today's snowmobiles are remarkably quiet -- operating at a level 94% below their counterparts of ten years before. New snowmobiles are certified independently as emitting no more than 78 dBA under a full-throttle acceleration test and no more than 73 dBA at a constant speed of 15 mph. But even those figures are deceptive. U.S. Forest Service researcher Robin Harrison, a mechanical engineer, reported recently:

"Snowmobiles almost always emit less noise under actual operating conditions than under certification conditions...even trying as hard as we could...we could not make any of the snowmobiles come up to 78 dB(A).

"...The results I have described, along with...other data, are incorporated in the noise pollution prediction method developed by the Forest Service...(U)nder the absolute stillest, most quiet background conditions that I have ever recorded, the method estimates that these new snowmobiles would be barely audible, to a very carefully listening listener, only a very small percentage of the time, at 3000 feet...Bear in mind that the ambient sound level I am describing is less than 20 dB(A)--an extremely unusual situation. Under the more usual conditions found in a wildland or outdoor recreation situation, with the ambient reading in the 30 dB(A) range, snowmobiles would probably not be detected beyond one-fourth of that distance...(U)nder conditions of a developed winter campground, which included some typical campground sounds ...at distances beyond 400 feet, the snowmobile was only barely detectable above the normal campground noise."

Improvements in the machine go beyond sound levels. Today's snowmobiles are dependable, easy to operate and safe for family members of all ages. Virtually every major safety-related component meets a rigid voluntary standard. Moreover, an independent testing company provides the public with certification that these standards are met. Every snowmobile being produced for sale in North America is currently covered by this program.

Gasoline Availability

Also critical to the future of the sport of snowmobiling is the continued availability of gasoline to power the machines. Since 1973, the snowmobile community has fought for -- and succeeded to date in securing -- equitable treatment of snowmobiling in energy policy decisions.

Beginning with the Arab oil embargo in 1973, the need for snowmobile community vigilance on energy issues has been made clear repeatedly. The U.S. House of Representatives considered a 20% excise tax on snowmobiles, boats and private aircraft in 1975 and rejected it. During the winter of 1978, the U.S. Congress comtemplated imposing mandatory energy conservation measures on various vehicles used for recreation and chose not to do so. During 1979, the U.S. Congress considered and defeated a discriminatory gas rationing plan.

The next several years may bring similar misguided energy-related challenges to snowmobiling. In both Canada and the U.S., pressure will be exerted by the federal governments to force conservation of energy, especially gasoline. Pricing policies, allocation systems and perhaps even rationing programs will be utilized.

We feel quite confident that any proposals narrowly targeted at snowmobiling or other motorized recreation activities will be ultimately rejected both on grounds of fairness and on the political ramifications from a strong and unified snowmobiler community. Our belief is based upon the minuscule amount of gasoline used by each snowmobiler, and by all snowmobiles collectively.

The average snowmobile uses some .89 gallon per hour. The sport, collectively, consumes 12/100ths of 1% of all gasoline used in the United States. These consumption figures, based upon federal contractors' work, have been widely acknowledged. The Council on Environmental Quality published the report "Off Road Vehicles on Public Land" in May 1979. That report concluded:

"ORV and snowmobile use represents such a small fraction of the nation's energy consumption that even if they were entirely eliminated, the energy saved would probably not be worth the effort."

That conclusion was further reinforced on the floor of the U.S. Senate by fifteen Senators in a colloquy on snowmobiling last July. These Senators, Democrats and Republicans, from the east and from the west and representing all points on the ideological specturm, pledged their efforts to assure fairness in federal policies affecting snowmobiling and to assure the availability of gasoline and the scenic natural areas on which the sport depends. A few quotes follow:

from the Honorable Max Baucus, U.S. Senator from Montana --

"When we start creating priorities among various users of energy, we run the risk of making serious mistakes...I simply pose the

question of what kind of a society would we have if we allowed no energy use for recreation? Either indoor or outdoor? I believe that recreation -- leisure time activity -- is very important to our form of society, to our mental and physical health. Therefore, when we plan for energy uses, I urge ample and due consideration to be given to the use of energy in recreation."

from the Honorable Jake Garn, U.S. Senator from Utah --

"Whether it is the energy to allow a worker to get to his job, or to allow a Pennsylvania family to travel to the West by automobile to see our national parks, or the energy needed by snowmobilers to overcome the barriers of freezing temperatures and deep snow, we need to take the steps now which will assure its availability."

from the Honorable Donald Riegle, Jr., U.S. Senator from Michigan --

"Snowmobiles use very little gasoline, accounting for barely 12/100 of 1 percent of our national comsumption. I don't think that anyone in the recreation industry would quarrel with the need to conserve fuel, and to restrict use during severe supply shortages, such as those that would trigger rationing. My point is that any rationing plan must be constructed in an equitable manner, so that all forms of travel are impacted in an equal fashion."

SUMMARY

Compared to its first two decades, snowmobiling's third decade should prove clearly positive and less volatile. As snowmobile trail networks continue to grow so, too, will the network of resorts and support facilities serving the snowmobiling public. Happily, evidence today suggests that actions by government, by snowmobiler associations, by governmental and private tourism organizations and by the snowmobile industry are well underway to continue to make snowmobiling a popular element of the North American winter recreational scene.

Moreover, by working with the nordic ski community, government officials at various levels, tourism interests and others, the snowmobile community believes it can hlep make winter outdoors more fun for Americans of all ages -- offering a safe, exciting and healthful alternative to sedentary, indoor winter lifestyles.

WOODALL PUBLISHING COMPANY, AN IMPORTANT INDUSTRY SOURCE OF CAMPING INFORMATION[1]

Curtis Fuller, Chairman of the Board
Woodall Publishing Company
Highland Park, IL

Paul Foght, Marketing Director
Woodall Publishing Company
Highland Park, IL

Linda Profaizer, Directory Publisher
Woodall Publishing Company
Highland Park, IL

Since 1967 the Woodall Publishing Company of Highland Park, Ill., has gathered annual statistics on privately owned campgrounds in the United States, Canada and Mexico and to a lesser extent on public campgrounds. At first the information gathered consisted of little more than hand tallies of the number of campgrounds by state and degree of development, of the number of campsites in the campgrounds and a breakdown of those campsites by number of electrical, water and sewer hookups available. It has since become much more detailed.

This information is gathered by on-site annual inspections of the privately owned campgrounds, by occasional inspection of public campgrounds and by annual mail questionnaires to all known public campgrounds. The inspectors are husband-wife teams who visit the privately owned campgrounds personally, rate the campgrounds and complete detailed descriptive listing forms.

The information thus gathered is placed in an editorial format and printed in the various editions of Woodall's campground directories. Woodall's began with 15 husband-wife field teams and today has 30 to 40 such teams. They are individually trained in the field and in week-long annual seminars.

Each year Woodall's inspects and rates 9,000 to 11,000 private campgrounds, inspects some publics, and gathers mail data on 4,500 to 6,000 more publics. Because the data is a by-product of the production of Woodall's campground directories every effort is made to keep it as accurate and as reflective of trends as possible. Occasionally Woodall's receives criticism that the information is limited to the campgrounds listed. Woodall's response is that no other institution makes annual inspections of all campgrounds, even within a state. Obviously no such collection of data can be perfect, but it is believed to be the best possible to obtain from a practical viewpoint. It would be impossible to duplicate by mail surveys.

The Woodall data does not cover every U.S. private campground. It does not include those with fewer than 10 spaces but it does include mobile home parks which reserve five or more spaces for transients. It does not include campgrounds where Woodall representatives subjectively would not care to stay. It does not include campgrounds with filthy washrooms or dirty and littered campsites and grounds. Each year Woodall's deletes 500 to 1,000 campgrounds for various reasons.

When one considers Woodall's data -- or any data on campgrounds -- the first problem is one of definition. What is a campground? That is a difficult question and Woodall's has been wrestling with it for many years. Is it a lovely spot beside a lake or a river with a few designated sites and only a pump for water and outhouses for relief? Woodall's definitions state simply "yes, it can be," depending on the representative's report. Is it a paved RV park parking lot? Is it a lots-for-sale condominium resort? Is it a park filled with season leases? Is it a time-sharing resort? There are many questions and Woodall's currently defines a campground in rather general terms as follows:

"A campground is a camping area, usually

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

in a rural or natural setting, that accepts both tents and recreational vehicles. There may be little formal development."

"An RV park is a camping area that usually has devoted considerable attention to formal site development. It generally caters to RV's and their requirements. Often an RV park does not accept walk-ins or tents and sometimes does not accept tent trailers or other non-full hookup units."

From the first simple hand tallies of data beginning in 1967 Woodall's information has progressively become more detailed until today complete computer print-outs of information are available by state and nationally for the following information:

1. Comparative totals of private and public campgrounds by year, giving facility ratings and number of total campsites, and with tallies of electric, water and sewer hookups, number of campgrounds planned, and number under construction. This data has been gathered since 1967.

2. Since 1977 Woodall's has produced an annual computer count of total facilities in 113 categories by state and nationally in all private campgrounds. The data has not been collected long enough to provide meaningful trends.

3. Intermittently through the years, and most recently in 1977, 1978 and 1979, the base rates charged by private campgrounds have been compiled by state and nationally. This study has become progressively more complete through the years.

In addition to these ongoing studies, the company has from time to time hired private research firms to conduct studies of the RV industry and of campers both to provide marketing information and guidance for editorial policies. The company division that has sponsored these surveys is Woodall's Trailer & RV Travel, a leading RV camping magazine.

The history of market research at Woodall's encompasses five major studies conducted in 1969, 1973, 1978 and 1979. All of these studies were conducted for Woodall's by recognized market research firms using self-administered direct mail questionnaires, pretested by interviews, and mailed to randomly selected owners of recreation vehicles.

These efforts were preceded by a series of interviews with recreation vehicle campers in five states conducted in 1967 for Woodall's by Dr. Bernard I. Loft of Indiana University.

Although Dr. Loft's sample was small, and his procedure for selecting interviewees highly personalized, that study reached conclusions about the RV camping family which, although contrary to the conventional wisdom of the time, have only been further substantiated by our decade of structured studies computed with lots of weighted sums and standard deviations.

The conclusions about RV campers that have stood the test of time and statistical inquiry are:

Observation #1. RV campers are relatively affluent. In 1967, the individuals interviewed had median incomes of approximately $9000 which compared to a median of $8330 in 1966 for male professional and technical workers.

In 1979, subscribers to Woodall's RV TRAVEL Magazine have average household incomes of $24,700 with 43% earning over $25,000. At this point it should be noted that in 1969 and 1973 Woodall's studies involved panels of 6000 RV campers, 3000 selected from the subscription list of WOODALL'S RV TRAVEL Magazine and 3000 controls selected from state RV license registration lists. Except for the magazine subscribers having upscale demographic characteristics, these groups appeared so much alike that panels of 3000 magazine subscribers only were used for two 1978 studies and the 1979 study.

Observation #2. RV campers are mature. In 1967, the median age of Dr. Loft's interviewees was in the range 50 to 54. In 1979, WOODALL'S RV TRAVEL subscribers has a median age of 52.8, with 56% being between age 45 and 64.

Observation #3. Only half of RV campers travel with children. In 1967, the median number of persons camping in the groups interviewed by Dr. Loft was two. That number was still correct in 1979, and the young age of children who do sometimes camp with the RV owner strongly suggests that they are grandchildren of the RV owners.

Besides determining that the demographic character of the RV camper has been unchanging, Woodall's studies have been designed to predict purchasing intentions for RVs and RV accessories, and travel patterns. In this role, the studies have demonstrated a high prediction value. In 1969, the shift from towed to motorized RVs was foreseen. In 1979, RV camper interest in smaller RVs was predicted. In 1979, our study also showed that the number of days of camping would remain essentially unchanged, but that distance traveled would be shorter. An interest in owning condominium campsites was measured at the 10% level in 1979, but it was also found

that owners of such campsites still tend to take a major vacation trip away from that proprietary location.

Still uncorroborated by other work is our 1979 effort to establish the lifestyle characteristics, or psychographics, of the RV owner. We found the RV camper to be more family oriented than average, and we found the family unit gets along better on camping trips -- both parent to child and husband to wife. We found RV campers to be outgoing people who like to come and go as they please. Many are seeking release from stressful occupations and seek an opportunity to do nothing. The RV camper was found to be practical minded and careful of how money is spent. This manifests itself in a consumer who is price sensitive, but not as the result of low income. Through choice, RV campers regard themselves as do-it-yourselfers. This trait is probably a manifestation of an independent lifestyle and a desire to be creative.

Because Woodall's demographic observations have been corroborated by the very significant consumer attitude studies being sponsored by the Recreation Vehicle Industry Association at the University of Michigan, we look forward to the time when they will also confirm our findings on these lifestyle characteristics.

Other obvious industry sources which have made important camping studies are A.C. Nielsen Company, the Gallup organization, Minnesota Mining & Manufacturing Company, and the Recreational Vehicle Industries Association. The latter organization publishes monthly reports of RV shipments by manufacturers in various categories and is reported to be planning to develop a reporting system for RV sales at a dealer level.

The consumer studies RVIA is currently funding through the University of Michigan may prove even more valuable than these efforts. In defining the characteristics of the RV owner, these studies have demonstrated that the RV family is most likely to be one that owns three or more motor vehicles. In examining the intentions of non-RV owning families to buy RVs, the study currently finds that the intention to buy is low, but the intention to rent an RV is very high, suggesting that there are still additional families planning to join the RV camping community.

All of Woodall's current data points to a reasonably healthy private campground industry at present, as contrasted with the state of RV manufacturing, which at this time is operating at less than half of 1978 volumes. Exhibit I charts a fairly constant gain in private campgrounds between 1967 and 1973 when the country began to experience fuel difficulties. There was a slacking off in number of campsites added to the national inventory until 1976 when there was a rather dramatic rise through 1979.

Within this overall picture, the number of campgrounds that Woodall's believed worth inspecting and listing dropped overall from 9,591 to 8,016 (Table 1). The number of private campgrounds has varied by no more than 200 from a mean of 8,000 for the years 1975 through 1979. During the same five years, however, the number of campsites has continued to increase.

When Woodall's began its record-keeping for the 1967 calendar year, 267,424 campsites were found in private campgrounds. This was an average of only 27.88 sites per campground. That figure increased annually for the next 13 years and in 1979 averaged 96.57 campsites per campground. Since several studies have shown that only larger campgrounds can generally hope to be profitable, this trend can be expected to continue.

During this same 13-year period the number of full hookups in private campgrounds increased from 98,000 to 332,000, while the proportion of such hookups increased from 26.4% to 42.9%. The proportion of hookups with water and electricity also increased while the number of campsites without any hookups declined from 143,000 in 1968 to 107,241 in 1979. Percentagewise, 38.3% of private campsites had no hookups in 1968 while only 14.0% had no hookups in 1979.

The record clearly shows a dramatic increase in campground amenities, expansion and investment and a falling out of marginal campgrounds during the years studied.

The same trends can be shown for public campgrounds although the statistical record is more uneven. This unevenness may reflect Woodall's inability in all years to obtain equal responses from its mail questionnaires to the public campgrounds. Nonetheless, over the 13-year period in question, the total public campground inventory does not seem to have changed appreciably but the number of campsites has nearly doubled, from 177,000 to 339,374 (Table 2). During the same period the size of the average public campground increased from 30.99 campsites to 67.12 campsites.

The public campgrounds remain substantially less developed than the privates (Exhibit 2). In 1979 only 3.28% had full hookups compared with 42.9% for the private campgrounds; only 11.9% had water and elec-

EXHIBIT I. Changes in Inventory of U.S. Private Campgrounds, 1967-1979

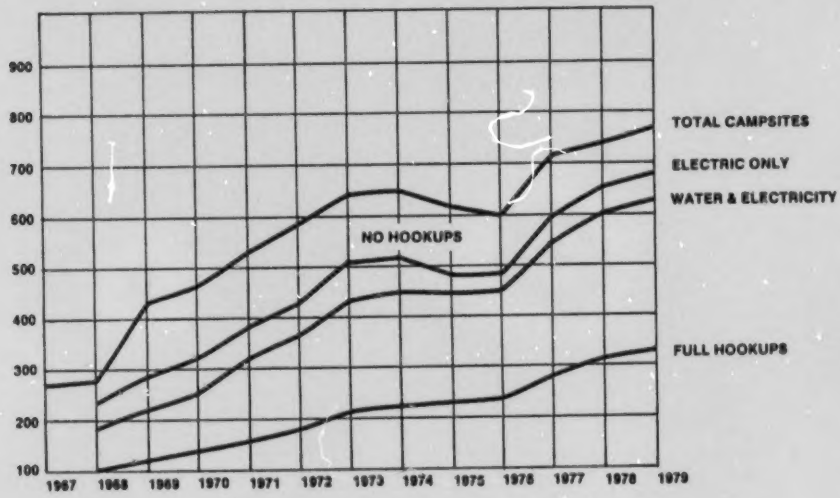


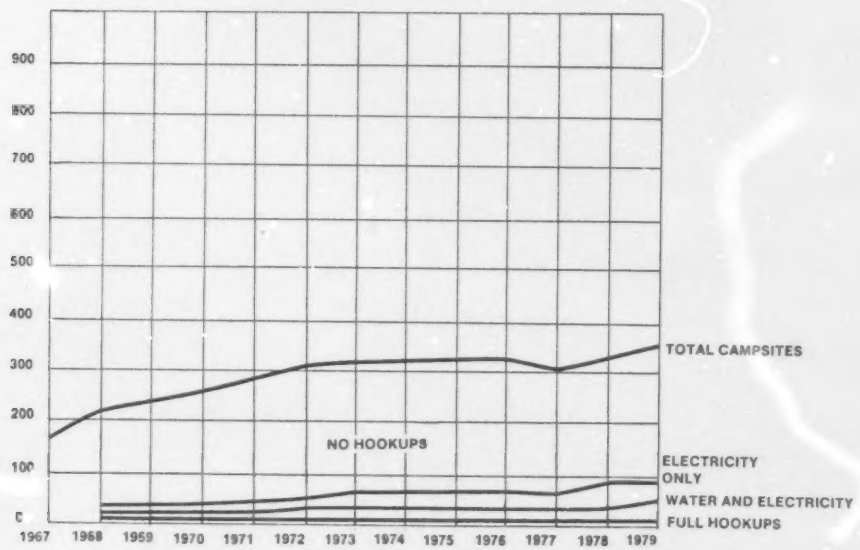
TABLE I. U.S. Private Campgrounds by Year 1967-79

YEAR	NUMBER OF CAMPSITES					NUMBER OF CAMPGROUNDS	AVERAGE NO. OF SITES PER CAMPGROUND
	Full Hookups	Water & Electricity	Electricity	No Hookups	Total Campsites		
1967					267,424	9,591	27.82
1968	98.410	177.713	229,904	142,984	372,888	9,520	39.17
1969	116,996	215,349	286,785	138,831	425,616	9,267	45.93
1970	127,297	250,951	318,707	143,679	462,386	9,513	48.61
1971	152,357	312,906	385,337	148,747	534,084	8,665	61.64
1972	178,429	358,658	429,299	154,380	583,679	9,190	63.51
1973	215,082	432,855	501,782	142,284	644,066	9,044	71.21
1974	227,195	454,152	512,900	130,253	643,153	8,685	74.05
1975	229,292	448,447	494,552	117,421	611,973	8,180	74.81
1976	232,941	449,211	492,261	107,707	599,968	7,864	76.29
1977	285,532	555,083	602,835	113,887	716,722	8,164	87.79
1978	313,995	601,263	649,084	103,770	752,854	8,202	91.79
1979	331,799	622,786	666,895	107,241	774,136	8,016	96.57

TABLE 2. U.S. Public Campgrounds by Year 1967-79

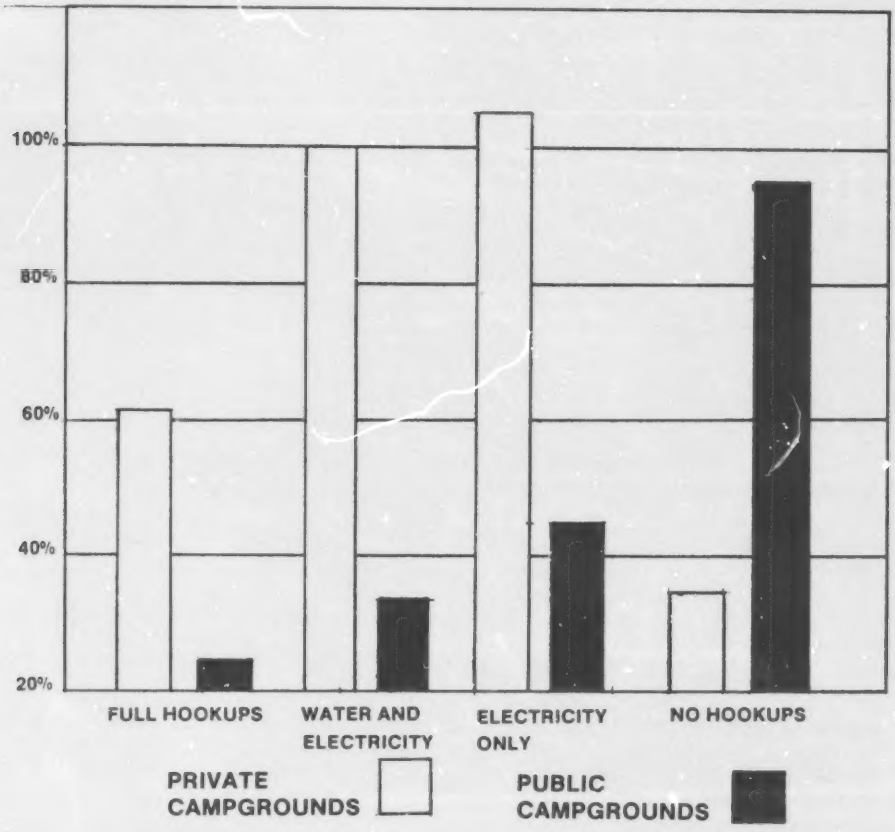
YEAR	NUMBER OF CAMPSITES					NUMBER OF CAMPGROUNDS	AVERAGE SITES PER CAMPGROUND
	Full Hookups	Water & Electricity	Electricity	No Hookups	Total Campsites		
1967					177,000	5,711	30.99
1968	4,607	10,257	32,004	173,450	205,454	6,626	31.00
1969	4,840	9,947	33,148	197,247	230,395	6,928	33.26
1970	4,720	10,269	33,402	214,070	247,472	7,566	32.71
1971	6,871	13,818	47,990	237,985	285,975	6,613	43.24
1972	7,943	24,008	58,821	247,238	306,059	6,463	47.36
1973	8,378	27,856	69,158	251,483	320,641	5,679	56.46
1974	8,642	29,490	74,570	247,103	321,673	5,439	59.14
1975	8,716	30,843	74,715	246,940	321,655	6,168	52.15
1976	9,158	33,564	77,973	254,924	332,897	5,792	57.48
1977	10,651	33,406	73,934	237,280	311,214	4,668	66.67
1978	10,308	38,097	84,142	244,877	329,019	4,991	65.92
1979	11,136	40,542	90,807	248,567	339,374	5,056	67.12

EXHIBIT 2. Changes in Inventory of U.S. Public Campgrounds, 1967-79



tricity, and only 26.8% had electricity. Since 73.2% of public campsites have no hookups of any kind it is obvious that they serve a somewhat different purpose or a different public than do the private campgrounds (Exhibit 3).

EXHIBIT 3. Comparison of Hookups in Private vs. Public Campgrounds, 1979



Woodall's has maintained records of the reasons for deleting campgrounds from its directory since 1969. During the 11-year period through 1979, the company deleted 10,129 private campgrounds from its directory listings--a remarkable indication of the volatility and turnover in this industry. It should be noted that the 10,129 figure is more than 2,000 higher than the toal number of U.S. privately owned campgrounds listed in the company's directory today. These deletions by year are shown in Table 3.

Of the 1095 deleted in 1979, 47.4% or 519 were deleted because they had fewer than 10 spaces or were considered to be substandard. Another 57% or 625 were either out of business or were no longer able to accept new campers because they were full of permanent campers. The balance, 176 or 16.1%, were deleted either at the owner's request or represented duplicate directory listings. It is estimated that about a third of the latter group or about 5% to 6% of this group were deleted at the owner's request.

TABLE 3.

Deletions From Woodall's Campground Directory (1969 through 1979)

1969	957
1970	805
1971	643
1972	767
1973	1,294
1974	1,348
1975	1,004
1976	848
1977	497
1978	871
1979	1,095

The company has not made a definitive analysis of the reasons for the 10,000 deletions over the years but such study would undoubtedly provide significant information.

It has been apparent to most students of private campgrounds that it has not been a highly profitable industry. All studies made of the campground business have concluded that campground rates tend to be too low and that small campgrounds are unprofitable. For this reason Woodall's, as a publishing company serving all segments of the camping/RV industry, has taken the position that higher campground rates, by strengthening campgrounds, do at the same time strengthen all areas of the industry and make it more attractive to campers. Woodall's began to gather campground rate data in 1968 and has carried on interim studies from time to time, with annual studies being made since 1977.

To simplify its analysis of campground rates, the company adopted the system of recording base rates, even though the difinition of base rate differs from campground to campground. The variation in methods for calculating rates varies so widely among campgrounds that any other approach would be unwieldy.

In 1968, Woodall's studied the base rates of 3,614 campgrounds and discovered that 1,911, or more than half, were charging $2.00 or less as a daily fee; 1,159 were charging either $2.25 or $2.50; 439 were charging over $3.00. By 1977 the mean base rate charged by campgrounds had increased to $4.50 per night and in 1978 to $5.00. In 1979 it was between $5.00 and $5.50 with the average base rate, assuming a one-night stay in every U.S. campground, standing at $5.32. In 1979 38.7% of campgrounds had base rates of $6.00 or more and 3.9% charged $8.00 or more. The spread of 1979 rates is charted on Exhibit 4 and in the following Table 4.

In interpreting this data it should be remembered that there is no standard according to which base rates are charged. Some campgrounds have a basic charge for two persons, with extra charges for each additional person. Some do not charge for extra persons. Some have a basic charge for four. Some charge by the family. Others charge per person in the party. There are also varying extra charges for one, two or three hookups while some campgrounds include all hookups in their base charge. Woodall's has the data on these variations but has not attempted to analyze it except in general terms.

The third general area in which Woodall's directory division gathers data is to tabulate various facilities. These also are broken down by state and nationally. In 1979 Woodall's produced data on the recreational facilities of private campgrounds in 83 categories, including recreation halls, heated pools, river swimming, canoe rentals, boat ramps, golf courses, handball courts, horseriding trails, float trips, racquetball courts, snowmobiling trails and so on. Physical facilities in campgrounds were broken down into 48 categories. All this information is available but would be tedious to list here.

In summary, then, the Woodall Publishing Company has enormous amounts of digested, semi-digested and raw data on campgrounds which it is willing to make available to qualified industry sources and researchers. The computerized data in Woodall's files and in its campground directories represents the physical status of the private campground industry, and to a lesser extent of the public campground industry, on an annual basis.

Woodall's 1980 directories contain descriptions of 13,072 campgrounds and RV parks and nearly all of this information has been summarized in computer print-outs. In addition, similar data is available on 2,504 campgrounds and parks in Canada, Mexico, and Central America.

An additional 890 which were rejected in 1979 as not qualifying are in the file and the data for this is also available.

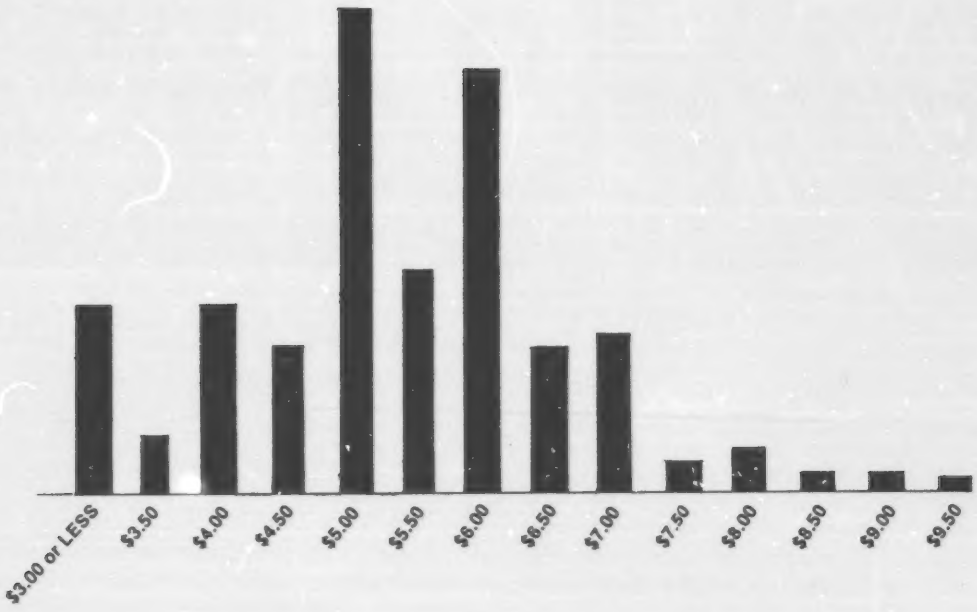
Table 4

BASE RATES CHARGED BY U.S. CAMPGROUNDS, 1979

Base Rates	Number of Campgrounds
$3.00 or less	711
3.50	205
4.00	740
4.50	655
5.00	1,787
5.50	815
6.00	1,526
6.50	531
7.00	573
7.50	163
8.00	178
8.50	63
9.00	54
9.50	18
Total Reporting	8,019

Average: $5.32

Exhibit 4. Base Rates Charged by 8,019 U.S. Campgrounds, 1979



Appendix 1

NUMBER OF CAMPSITES IN ALL STATES - 1969 vs. 1979

State	No. of Campsites in Private Campgrounds 1969	1979	No. of Campsites in Public Campgrounds 1969	1979	Total Campsites 1969	1979
Alabama	3,533	3,901	643	3,222	4,176	7,123
Alaska	1,588	1,605	1,727	1,944	3,315	3,549
Arizona	11,325	33,354	3,383	6,217	14,708	39,571
Arkansas	1,585	4,576	4,550	5,221	6,135	9,797
California	27,838	49,093	29,827	34,667	57,665	83,760
Colorado	8,776	16,543	6,798	9,241	15,574	25,784
Connecticut	2,711	7,799	1,837	1,414	4,548	9,213
Delaware	2,380	3,784	760	660	3,140	4,444
D.C.	-	-	-	-	-	-
Florida	33,194	74,967	4,039	6,483	37,233	81,450
Georgia	3,100	8,095	3,519	6,224	6,619	14,319
Hawaii	-	-	143	460	143	460
Idaho	5,220	5,578	3,219	2,776	8,439	8,354
Illinois	19,787	27,242	7,345	11,462	27,132	38,704
Indiana	19,039	25,313	4,846	10,798	23,885	36,111
Iowa	4,308	6,849	4,644	13,434	8,952	20,283
Kansas	1,732	2,838	956	7,980	2,688	10,818
Kentucky	4,913	12,824	2,680	6,942	7,593	19,766
Louisiana	1,982	7,267	518	1,500	2,500	8,767
Maine	12,789	17,769	1,759	1,734	14,548	19,503
Maryland	3,169	5,678	1,213	2,791	4,382	8,469
Massachusetts	6,703	13,218	2,783	3,323	9,486	16,541
Michigan	12,507	31,524	20,982	25,384	33,489	56,908
Minnesota	11,994	14,744	5,179	7,817	17,173	22,561
Mississippi	1,050	2,311	2,398	3,127	3,448	5,438
Missouri	3,987	15,408	4,383	8,319	8,370	23,727
Montana	5,347	8,996	3,402	6,048	8,749	15,044
Nebraska	2,652	2,535	3,034	6,410	5,686	8,945
Nevada	2,280	5,860	2,050	1,882	4,330	7,742
New Hampshire	7,378	14,444	2,012	2,071	9,390	16,515
New Jersey	8,267	22,972	1,101	1,090	9,368	24,062
New Mexico	2,463	5,368	1,222	2,324	3,685	7,692
New York	23,496	40,318	10,298	14,623	33,794	54,941
North Carolina	13,341	19,356	3,713	4,186	17,054	23,542
North Dakota	802	1,303	1,761	3,792	2,563	5,095
Ohio	27,515	42,564	7,540	12,899	36,055	55,463
Oklahoma	1,297	2,698	7,323	9,241	8,620	11,939
Oregon	7,503	9,889	11,113	13,901	18,616	23,790
Pennsylvania	20,234	38,507	3,981	9,567	24,215	48,074
Rhode Island	949	3,109	818	1,182	1,767	4,291
South Carolina	10,392	15,446	1,193	3,218	11,585	18,664
South Dakota	5,909	6,802	3,506	3,786	9,415	10,588
Tennessee	6,255	13,017	4,184	4,759	10,439	17,776
Texas	8,479	40,698	5,246	13,200	13,725	53,898
Utah	2,615	6,842	3,994	4,481	6,609	11,324
Vermont	3,390	5,356	2,072	2,249	5,462	7,605
Virginia	15,838	20,669	5,124	4,944	20,962	25,613
Washington	14,435	15,130	10,088	9,702	24,523	24,832
West Virginia	1,307	3,681	1,113	2,680	2,420	6,361
Wisconsin	21,293	30,546	9,950	12,253	31,243	42,799
Wyoming	5,969	5,749	4,426	5,746	10,395	11,495
U.S.A. Totals	425,616	774,136	230,395	339,374	656,011	1,113,510

Woodall base rate survey by states

Base Rates	$3.00 or less	$3.50	$4.00	$4.50	$5.00	$5.50	$6.00	$6.50	$7.00	$7.50	$8.00	$8.50	$9.00	$9.50	$10.00	$10.50	$11.00	$11.50	Total Reporting	Not Available	Total Campgrounds	Mean Base Rate
Alabama	4	1	7	4	18	5	12	0	5	0	1	0	0	0	0	0	0	0	57	0	57	5.00
Arizona	36	2	18	15	35	19	54	23	27	9	10	5	3	0	0	0	0	0	256	0	256	5.50
Arkansas	7	1	15	6	25	7	14	4	10	3	1	0	0	0	0	0	0	0	93	0	93	5.00
California	46	6	21	17	107	55	140	49	78	29	39	17	11	6	0	0	0	0	621	0	621	5.50
Colorado	7	6	18	24	50	27	41	20	18	5	3	0	0	0	0	0	0	0	217	0	217	5.00
Connecticut	3	1	3	1	13	4	14	8	8	2	6	0	0	0	0	0	0	0	63	0	63	5.50
Delaware	0	1	0	4	0	5	3	2	0	1	1	1	0	0	0	0	0	0	18	0	18	5.50
Florida	197	1	5	5	45	22	54	28	39	17	18	8	8	4	0	0	0	0	451	0	451	5.00
Georgia	6	2	10	13	20	10	18	10	6	1	2	0	1	0	0	0	0	0	99	0	99	5.00
Idaho	7	3	11	7	29	13	31	12	1	1	1	1	0	0	0	0	0	0	117	0	117	5.00
Illinois	13	3	22	12	38	20	36	13	14	4	3	0	0	0	0	0	0	0	176	0	176	5.00
Indiana	21	6	38	24	33	14	24	12	4	0	0	0	0	0	0	0	0	0	166	0	166	5.00
Iowa	6	4	9	12	17	7	11	2	0	0	1	0	0	0	0	0	0	0	69	0	69	5.00
Kansas	5	5	5	7	14	8	7	0	0	1	0	0	0	0	0	0	0	0	52	0	52	5.00
Kentucky	8	3	9	6	17	10	10	5	2	0	0	1	0	0	0	0	0	0	71	0	71	5.00
Louisiana	6	5	6	4	17	5	15	7	6	4	4	0	1	0	0	0	0	0	80	0	80	5.00
Maine	6	2	15	18	39	20	37	14	29	5	2	1	0	1	0	0	0	0	189	0	189	5.00
Maryland	2	1	5	3	10	6	10	3	4	2	2	0	1	0	0	0	0	0	49	0	49	5.50
Massachusetts	5	0	4	7	25	8	27	7	17	0	2	1	2	0	0	0	0	0	105	0	105	5.50
Michigan	25	9	30	29	78	43	73	30	25	7	6	2	4	2	0	0	0	0	362	0	362	5.50
Minnesota	8	9	31	24	81	35	46	16	15	3	0	1	0	0	0	0	0	0	269	0	269	5.00
Mississippi	5	2	3	4	15	3	5	1	2	1	4	0	0	0	0	0	0	0	45	0	45	5.00
Missouri	14	17	38	27	57	23	23	8	8	2	1	0	0	1	0	0	0	0	219	0	219	5.00
Montana	7	8	25	21	39	16	21	7	6	2	1	0	0	0	0	0	0	0	153	0	153	5.00
Nebraska	4	1	9	5	10	3	10	1	1	0	0	0	0	0	0	0	0	0	44	0	44	5.00
Nevada	11	2	3	2	14	3	10	5	12	1	3	3	0	0	0	0	0	0	69	0	69	5.00
New Hampshire	2	0	13	9	35	25	44	13	13	3	2	0	0	0	0	0	0	0	159	0	159	5.50
New Jersey	8	0	1	2	13	12	24	10	23	3	8	3	3	3	0	0	0	0	111	0	111	5.50
New Mexico	6	3	7	10	17	10	26	10	6	1	2	0	0	0	0	0	0	0	98	0	98	5.00
New York	29	10	38	43	68	47	83	24	24	7	9	1	4	0	0	0	0	0	385	0	385	5.00
North Carolina	10	3	18	13	52	28	62	12	20	3	7	2	0	0	0	0	0	0	230	0	230	5.50
North Dakota	4	2	4	7	2	3	1	0	0	0	0	0	0	0	0	0	0	0	23	0	23	4.50
Ohio	17	5	35	31	69	21	52	20	14	1	1	0	2	0	0	0	0	0	268	0	268	5.00
Oklahoma	7	2	6	5	16	5	8	6	3	1	0	0	0	0	0	0	0	0	59	0	59	5.00
Oregon	13	7	29	14	50	16	53	10	8	2	1	0	0	0	0	0	0	0	203	0	203	5.00
Pennsylvania	12	13	41	40	80	34	57	17	23	3	5	4	6	0	0	0	0	0	315	0	335	5.00
Rhode Island	0	1	2	1	6	5	4	2	1	0	2	0	0	0	0	0	0	0	24	0	24	5.50
South Carolina	8	0	8	3	14	8	9	5	9	3	2	1	1	0	0	0	0	0	71	0	71	5.00
South Dakota	4	2	13	9	22	10	18	5	1	3	1	0	0	0	0	0	0	0	89	0	89	5.00
Tennessee	11	5	11	16	42	8	23	7	12	3	2	1	1	0	0	0	0	0	142	0	142	5.00
Texas	44	19	42	47	149	63	109	32	18	14	8	3	2	0	0	0	0	0	550	0	550	5.00
Utah	4	2	7	4	28	12	27	3	7	1	0	1	0	0	0	0	0	0	96	0	96	5.50
Vermont	6	5	9	13	23	7	8	2	1	0	1	1	1	0	0	0	0	0	77	0	77	5.00
Virginia	9	0	7	10	24	15	47	24	15	5	2	2	0	0	0	0	0	0	160	0	160	6.00
Washington	20	9	40	27	82	31	45	11	14	3	6	2	0	0	0	0	0	0	290	0	290	5.00
West Virginia	7	8	15	5	9	3	4	2	4	0	0	0	0	0	0	0	0	0	54	0	54	4.50
Wisconsin	20	12	39	45	81	50	59	23	9	6	3	1	2	1	0	0	0	0	351	0	351	5.00
Wyoming	6	2	5	5	24	14	23	4	11	0	2	0	0	0	0	0	0	0	96	0	96	5.50

No data available from Hawaii.

Central America reported 17 campgrounds, but no base rate data.

Alaska reported 33 campgrounds, but no base rate data.

No data available from Northwest Territories.

† Data gathered in 1979 for the 1980 Woodall's Campground Directory

Appendix 3

1979 U.S. FACILITIES DATA,
BOTH RECREATIONAL AND PHYSICAL FACILITIES

FACILITIES	Number of Parks
Total sites	858,372
Total with full hookups	366,841
Total with elec & water hookups	317,746
Total with electric hookups	49,916
Total with no hookups sites	118,705

Number of Parks:

With season lease sites	3,100
With pull-thrus	4,656
With cable TV	429
With RV length of less than 33 feet	954
That accept full hookup units only	756
That exclude tents	966
That exclude tent trailers	146
That exclude motorhomes	6
That exclude vans	37
That exclude pickup campers	11
That exclude fifth wheel	16
That exclude travel trailers	13
That exclude motorcycles	1,095
With flush toilets	8,297
With chemical toilets	193
With pit toilets	856
With marine/recirculating toilets	53
With hot showers	8,242
That charge for hot showers	1,192
With cold showers	36
With basins	8,334
With dump station	0
That charge for dump station	0
With dump facility	6,035
With portable dump	438
With a laundry	5,367
With public phone	5,899
With phone available	2,788
With limited grocery	2,736
With grocery	1,424
With full service store	313
With RV supplies	2,024
With LP gas refill	2,527
With gasoline	1,199
With marine gas	543
With ice	6,025
With picnic tables	7,199
With patios	1,303
With fire areas	1,512
With bowling lanes	3
With pony rides	55
With playground	4,160
With handball courts	20
With horseriding trails	217
With horseriding rentals	199
With fire rings	2,506
With grills	1,496
With wood	3,964
With babysitting service	281
With church services	822
With recreation halls	2,356
With recreation halls for teens	98
With recreation halls for adults	216
With recreation rooms	3,170
With recreation rooms for teens	157
With recreational rooms for adults	114
With pavilions	1,297
With pavilions for teens	6
With pavilions for adults	10
With swimming pool	5,290
With more than 1 swimming pool	181
With indoor pools	65
With outdoor pools	0
With heated pools	1,171
That charge for swimming	191
With lake swimming	1,511
With ocean swimming	152
With river swimming	384
With pond swimming	349
With a sauna	103
With therapy pool	275
With water slides	100
With boating	2,608
With electric motors only	146
With no motors	432
With motorized launch	28
With boat ramp	1,486
With boat dock	1,526
With row boat rentals	1,560
With sail boat rentals	66
With canoe rentals	817
With pedal boat rentals	508
With ocean fishing	262
With lake fishing	2,146
With river fishing	1,362
With pond fishing	943
That charge for fishing	217
With 9-hole golf	29
That charge for 9-hole golf	25
With 18-hole golf	15
That charge for 18-hole golf	16
With par-3 golf	28
That charge for par-3 golf	15
With mini-golf	539
With driving range	36
With putting greens	48
With basketball courts	400
With more than one basketball court	83
With bike rentals	450
With ice skating rinks	15
With planned group activities	1,239
With a recreation director	325
With platform tennis	5
With racquet ball courts	8
With roller skating rink	20
With shuffleboard court	1,452
With tennis court	429
With more than 1 tennis court	330
With an archery range	54
With badminton	1,656

Number of Parks, Cont.

With batting cages	13
With croquet	274
With fishing guides	148
With float trips	121
With horseshoes	3,861
With motor bike trails	250
With nature hikes	894
With ski rentals	35
With cross country skiing	185
With downhill skiing	17
With scuba diving	50
With snowmobile trails	315
With snowmobile rentals	27
With volleyball	2,719
With water skiing	831
With local tours	230
With recreation open to non-camping public	1,023

RESTRICTIONS

Number of Parks:

That do not allow pets	307
Limited to adults only all year	440
Open all year	5,401
With 3 day minimum stay	5
With 7 day maximum stay	16

CBs

Number of Parks:

With CB channel monitored all year	0
With CB channel monitored 24 hours	0

CLASSIFICATION:

Number of campgrounds	6,078
Number of RV parks	1,019
Number of RV areas in a mobile home park	425
Number of RV spaces	1,901
Number of primitive campgrounds	61
Number of parks that require reservations	851
Number of planned & under construction parks	134
Number of rebuilding parks	51
Number of new parks	232

INDUSTRY SOURCES OF TREND DATA -- SKIING[1]

William F. Malcolm, Jr.
Chief Planner
Sno-Engineering Inc.
Resource Management
Post Office Box 65
Franconia, NH

OVERVIEW

With precious few exceptions, ski industry trend data does not exist. This paper will enumerate sources of trend data known to the author. The paper considers the probable causes of the lack of ski industry trend data and means to ameliorate the lack of trend data. Finally, the paper presents a rationale for acquiring improved ski industry trend data.

SKI INDUSTRY TREND DATA

The National Ski Areas Association (NSAA) sponsors an annual research/survey study entitled "Economic Analysis of North American Ski Areas", which reports the financial condition and operating characteristics of more than 50% of the American ski area capacity.[2]

The US Forest Service maintains annual pricing, usage and capacity data[3] on ski areas operating under special use permits. Although the capacity calculations have come under some criticism, the report does contain factual, unaggregated, area-specific skier visits and published ticket price information.

Periodically, the AC Nielsen Co.[4] has reported on the ski industry either in the context of overall outdoor recreation activity, or as an industry specific project.

Many ski industries[5] have supported or cooperated with researchers investigating their own skiers, resulting (in some cases) in annual skier "profiles".

Many recreation researchers[6] have been active in ski industry analysis during the past several years. Although not necessarily sources of trend data per se, these researchers do have a historical perspective that could be invaluable resources for certain types of investigation.

A number of universities and colleges have recreation or natural resources planning programs that either maintain bibliographic catalogues[7] of ski industry studies, or actively publish and distribute industry specific monographs. Collectively, these monographs are a form of trend data.

PROBABLE CAUSE FOR THE LACK OF SKI INDUSTRY TREND DATA

The "supply side" of the ski industry is characterized by many relatively small "producers". No one supplier or group of suppliers dominates (in terms of market share) the supply of alpine skiing. Most ski areas are, by definition, "small businesses" and many are owned and operated as a family business.

Although there is some movement towards large corporate acquisitions (20th Century Fox, Ralston-Purina, etc.) and mergers between ski areas (Sugarbush and Glen Ellen, Stratton and Bromley, etc.) the vast majority of ski areas in North America are owned and operated by entrepreneurs. These entrepreneurs are generally good day-to-day managers, but many times lack the capital base for major expansion.

The larger areas conduct their own, albeit limited, demand research to satisfy marketing planning expansion requirements. Smaller areas rely heavily on the intuition of management and the extrapolation of past performance.

Thus the fragmented nature of the supply function, coupled with varying management priorities has not lead to the creation of a sophisticated on-going mandate for either supply or demand side trend data research. The exception may be a general support of the research by NSAA in its annual "Economic Analysis of North American Ski Areas".

AMELIORATION OF TREND DATA RESEARCH

As noted above, the NSAA "supply side" "Economic Analysis" presents a relatively comprehensive look at the ski industry over time. The primary improvement to this excellent resource would be broader industry participation. Perhaps this could be achieved by heavier promotional efforts or more persistent followup techniques.

The US Forest Service study noted above is helpful (although limited to those on Forest Service land) and could be imporved by rationalizing the capacity component through more rigorous, uniform criteria and more comprehensive evaluative techniques.

Demand side trend research will require a "major" supporter to provide the continuing resources necessary to achieve the inherent objectives. Many vehicles are available inside and outside the industry. The absence of demand trend data is clear; the necessity is stated below.

RATIONALE (NECESSITY) FOR IMPROVED SKI INDUSTRY TREND DATA

Significant public and private capital and human resources are employed in delivering the recreational activity focused on snow skiing. To the extent we wish to maximize the return on capital and labor, we need to know how to create the desired product or products. Or, expressed from the perspective of the skier, "Who will offer what I want, when I want it, at a price that I feel is reasonable?" It is this arbitrage between knowledgeable suppliers and knowledgeable consumers (whether active, potential, or drop-out) that will result in a healthier, more vigorous, socially useful industry.

FOOTNOTES

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham NH, April 20-23, 1980.

[2]ECONOMIC ANALYSIS OF NORTH AMERICAN SKI AREAS: 1977-78 SEASON. C.R. Geoldner and Ted Farwell. Business Research Division, Graduate School of Business Administration, University of Colorado, Boulder, CO. 1978. 140 pp. $30.

[3]US Forest Service Pricing Study Printout. August 1979.

[4]CONFIDENTIAL REPORT ON THE SPORT OF SNOW SKIING. Nielsen Custom Research Service, AC Nielsen Co., Nielsen Plaza, Northbrook, IL. 1979.

[5]THE ASPEN SKIER: 1977-78 SEASON. C.R. Goeldner, Business Research Division, University of Colorado, Campus os 420, Boulder, CO. 1978. 80 pp. $15.

THE BRECKENRIDGE SKIER. C.R. Goeldner and Yvonne Sletta, Business Research Division, University of Colorado, Boulder, CO. 1975. 67 pp. $10.

THE COLORADO SKIER: 1977-78 SEASON. C.R. Goeldner, Business Research Division, University of Colorado, Boulder, CO. 1978. 92 pp. $25.

THE COPPER MOUNTAIN SKIER, 1978-79. C.R. Goeldner and Jack Harrington, Business Research Division, University of Colorado, Boulder, CO. July 1979. 68 pp.

THE 1977-78 STEAMBOAT SKIER SURVEY. Charles K. Mayfield, Steamboat LTV Recreation Development, Box 1178, Steamboat Spgs., CO. 1978. 88 pp.

THE VAIL SKIER: 1977-78 SEASON. C.R. Goeldner, Business Research Division, University of Colorado, Boulder, CO. 1978. 106 pp. $15.

THE WINTER PARK SKIER: 1978-79 SEASON. C.R. Goeldner and Jack Harrington. Business Research Division, University of Colorado, Boulder, CO. June 1979. 49 pp.

[6]BIBLIOGRAPHY OF SKIING STUDIES. C.R. Goeldner and Karen Dicke. Business Research Division, University of Colorado, Boulder, CO. 1978. 62 pp. $10.

[7]Ibid.

SKI UTAH: A REPORT OF THE INDUSTRY. John D. Hunt and Christie Anderson. Institute for Outdoor Recreation and Tourism, Utah State University, Logan, UT. February 1976. 111 pp. $10.

WINTER RECREATION VISITOR STUDY, WISCONSIN. Rollin B. Cooper, Sue Sadowske, and Mark D. Kantor. Recreation Resources Center, University of Winconsin-Extension, 1815 University Avenue, Madison, WI. 1979.

TRENDS IN PARTICIPATION SPORTS DURING THE DECADE OF THE 70'S[1]

Robert J. Halstenrud[2]

Abstract.--Five nationwide surveys to determine participation in popular sports have been conducted since 1970. These, plus subsequent ones in the 1980's, will be useful to advertising agencies, the sporting goods industry and government planners. Swimming, bicycling, camping, fishing, and bowling have consistently held the top five spots. Jogging and tennis have recently moved into the top ten spots. Demographic changes, economic conditions and the energy situation may affect results of future participation surveys.

During the past ten years, the A.C. Nielsen Company has conducted five nationwide surveys designed to determine the estimated number of persons who are participating in several of the more popular sports. The first study, conducted in 1970, was a modest beginning which included only thirteen sport activities. The 1970 data were collected from respondents using the face-to-face personal interview approach. Three years later, in 1973, the second survey was conducted and coverage was increased to twenty-five sport categories. When launching the 1973 study a telephone interview, carried out in the quality-controlled environment of a centralized WATS facility, became the data collection method. These same telephone interviewing procedures have been used consistently in all of the subsequent studies of sports participation and, primarily for this reason, the 1973 survey serves as the benchmark for trending the results as measured in subsequent studies conducted during the 70's.

In 1974, widespread interest in tennis prompted a special, in-depth study designed to provide additional insights for this fast-growing market.

The fourth national study in 1976 represented a return to the conventional type of sports participation research, using the 1973 procedures, in order to report trends in a proper and consistent manner. Coverage was increased to 27 recreational sports. The 1979 survey is the fifth major piece of research conducted in connection with our on-going sports research program. This most recent study included 30 sport categories, of which 23 are common to all of the surveys carried out in 1973, 1976, and 1979. Using 1973 as the base or benchmark year, the three-year intervals between each of the major studies form the framework for trending the estimated number of participants in the various sports measured during the decade of the 70's.

As each study is conducted, a separate report is prepared for each sport category. Of course, the primary study objective is to provide a continuing and consistent research effort in the field of leisure-time participant sport activities. Having accomplished this purpose, one of the several major objectives is to develop projected estimates and trends of the total number of participants in the United States. Having identified the participants in each respective sport category, another of the objectives is to profile the players by several demographic characteristics such as age, sex, education, annual household income and geographic location. Frequency of participation is obtained to classify the participants into categories of "heavy", "medium" and "light" players. These levels of play are then profiled to determine whether and to what extent differences may exist that can be used as tools in marketing the sport to specific target groups.

The objective of using the survey data to predict the future number of participants in any given sport is another value inherent in the Nielsen studies. In our opinion, this predictive feature will become of greater significance as more studies are conducted during the upcoming decade of the 80's. These new measurement periods will add to our present bank of data to establish long-term trends which can be correlated with other known variables and tracking measures that are maintained over time in order to predict more accurately the future

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2]Manager, Nielsen Developmental Syndicated Surveys, A.C. Nielsen Company, Nielsen Plaza, Northbrook, IL 60062.

number of participants.

The combination of all of these objectives determines those all-important marketing strategies that are needed for a particular sport to sustain itself as a growing and successful activity operating in a competitive environment with other participant-type sports as well as other types of leisure-time activities from which consumers have to choose. Finally, depending upon the nature of the sport, some of our other study objectives include information on equipment purchases, years of participation, ownership of equipment requiring a fairly substantial purchase investment, and the extent of accidents and/or injuries associated with participation in the sport.

In the 1979 survey, interviews were completed with 3,003 households within the Continental United States. Cooperating respondents (male or female head of the household) provided information about the sports participation habits of 9,019 persons living in those homes. The sample was designed using a modified random-digit-dial process to select the households that were interviewed. To implement this plan, a sample of listed telephone households is selected proportionate to total household population by county across the 48 contiguous United States. From this selection, the area code, prefix and first digit of the suffix were used to identify working banks of telephone numbers. Random numbers were generated by computer and substituted for the last three digits of each suffix to produce the final telephone sample. This randomization procedure insures that a high proportion of unlisted and newly listed telephones are represented.

To correct for any sample imbalances in projecting the sports participation levels to the total household and person populations of the contiguous 48 states, the projection factors were computed for each sample cell examined to bring the projections into proper alignment with the universe estimates. For households, projection factors were produced by county size within state. The projection factors for household persons were computed by four United States census regions and within each region by sex and age categories. Through this weighting and projection process, it was possible to bring the surveyed sample in line with the census estimates.

Now for a quick look at definitions. A "participant" or "player" is defined as any person who participates in an activity or plays a sport from time to time during the past twelve months. Within each sport category, there are also standard definitions that are used to identify players as being "heavy", "medium", and "light", depending upon their frequency of participation. A "participant or player household" is defined as having one or more members who engage in an activity or play a sport from time to time during the past twelve months.

While these qualifying definitions have been used consistently in all of our sports surveys, it is possible for users of Nielsen research to establish different participant criteria other than those described. For example, some organizations may determine that part or all of the "light" participant category as defined may not represent a viable target market for their products and/or services. Under such circumstances, it is possible to adjust the estimated number of participants and their respective profiles according to the revised definition.

Let's look at the trends in participation sports by their popularity rankings (Table 1). Swimming is the number one sport in the ranking of popularity. Bicycling has maintained the number two position in popularity in each of the survey measurement years. Camping was ranked fourth in 1973 and 1976. This activity has been growing in the number of participants during the decade of the 70's and has moved into the third most popular position in 1979, replacing the sport of fishing, which has been holding steady in terms of participants. Others in the top-ten ranking of popularity include bowling, boating (other than sailing), jogging/running (measured for the first time in 1979), tennis, pool/billiards, and softball. Overall, nine of the top ten sports have been included in all three studies; and six of the nine have shown player growth during the 70's, while three categories have held steady.

Roller skating, another newcomer in 1979, achieves a popularity ranking of twelve. Water skiing, shown in 1979 to be 16th in popularity, is actually in the 14th spot among the sports that have been included in all of the measurement years. Snow skiing is ranked 18th, but it is 16th among the sports common to all three studies. Without question, water skiing and snow skiing have continued to move up in popularity since 1973. Table tennis and ice skating are moving downward in popularity, while the others in this group are holding their respective positions when the categories measured for the first time in 1979 (jogging/running and roller skating) are removed from the comparisons.

Racquetball is ranked twenty-first in popularity and leads the list of sports included in the third group of ten. Actually, on a 1976 to 1979 common base of twenty-seven sports (that is, not including the new categories added in 1979), racquetball in 1979 would rank nineteenth in popularity compared to being in the twenty-fourth position in 1976. Soccer was added to the list of sports measured in 1979, and is ranked twenty-fifth among the thirty categories in the study.

Table 1.--1979 popularity of participation sports -- top-thirty rankings

Activity	1973	1976	1979
Swimming	1	1	1
Bicycling	2	2	2
Camping	4	4	3
Fishing	3	3	4
Bowling	5	5	5
Boating (Other than sailing)	8	7	6
Jogging/running[a]	-	-	7
Tennis	12	9	8
Pool/billiards	7	6	9
Softball	9	10	10
Table tennis	6	8	11
Roller skating[a]	-	-	12
Basketball	11	11	13
Hunting	13	13	14
Ice skating	10	12	15
Water skiing	17	17	16
Golf	14	14	17
Snow skiing	20	18	18
Baseball	15	15	19
Football	16	16	20
Racquetball[b]	-	24	21
Motorbiking/motorcycling	18	19	22
Sailing	21	21	23
Snowmobiling	19	20	24
Soccer[a]	-	-	25
Handball[b]	-	23	26
Archery	22	22	27
Paddle tennis[b]	-	26	28
Ice hockey	23	25	29
Platform tennis[b]	-	27	30

[a]Not measured in 1973 and 1976.

[b]Not measured in 1973.

Even more important than the trends in the ranking of popularity are the trends as expressed by the actual number of estimated participants. The thirty sports have been divided into two major categories--team sports and individual-type sports. Simply defined, a team sport is an activity normally associated with a group effort, which allows player substitutions. Individual-type sports are those activities generally considered to be a singular effort (or perhaps a double-player endeavor) with no substitution of participants.

In the next series of figures, each sport is represented by a series of three vertical bars. The bar on the left sets forth the estimated number of projected participants, in millions, as measured by our 1973 benchmark survey. The middle bar is the projected figure from the 1976 survey, and the third bar relates the 1979 projection.

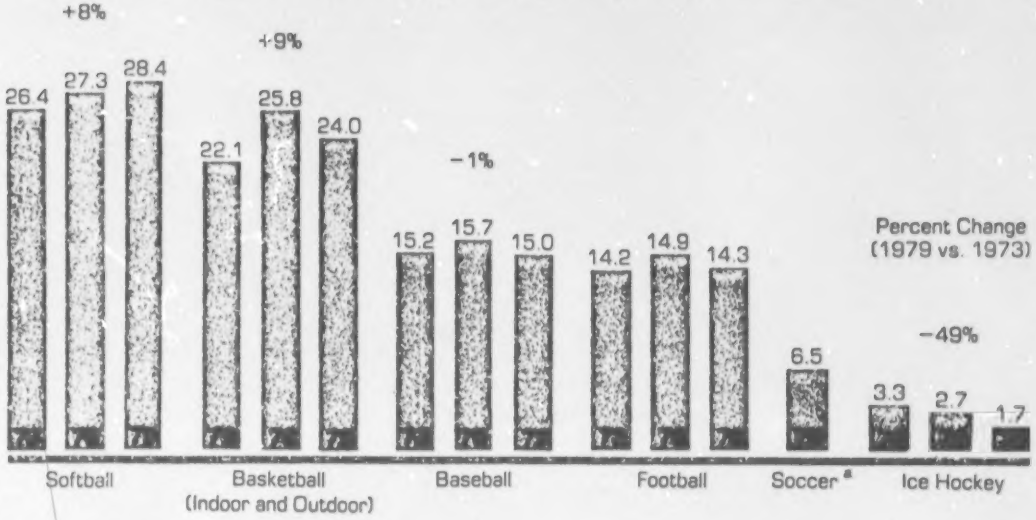
Among the team sports included in the Nielsen surveys (Figure 1.), softball is the most popular, and currently boasts a total of about 28.5 million players. This estimate is up about 8 percent from the 26.4 million projected in 1973. Basketball participation (including both indoor and outdoor play) is now at a level of 24 million, which is about 9 percent higher than the 22.1 million figure reported in the 1973 base-year study. Baseball and football trends are quite similar with the number of participants holding fairly steady at levels of just over 15 million and 14 million, respectively. Soccer, measured for the first time in 1979, appears to be coming on strong in the United States; the current estimate of participants is about six and one-half million. Ice hockey participation has been in a downward slide since 1973, going from 3.3 million players in the base year down to 2.7 million in 1976, to about 1.7 million in 1979.

To summarize the team sport trends during the 1970's, softball has shown consistent increases in the number of players across each of the measurement years. The remaining team sports reveal some modest declines in participation from 1976 to 1979. This is believed to be a reflection of the decline in the ranks of teenagers that has taken place during the late 70's. Softball, on the other hand, continues to be played by both males and females beyond the high school and teen years.

Figures 2a and 2b depict trends in individual-type sports that have shown growth in number of participants since 1973. It should be noted the sports are listed in order from left to right by popularity and not by their respective growth records. Bicycling, camping, bowling, and boating (other than sailing) have shown participant increases ranging from 6 percent to 16 percent since the base year study of 1973. Note the trend in the number of bicyclists; overall, an increase of about 6 percent is reported from 1973 to 1979. However, the projected number of bikers was down to about 70 million in 1979 from the 75 million as measured in 1976. If a new study was to be conducted in the spring of 1980, it is believed the number of bicyclists would be up to some degree over the 70 million reported in the spring of 1979, primarily because of the recent gas shortages and the dramatic increase in gasoline prices.

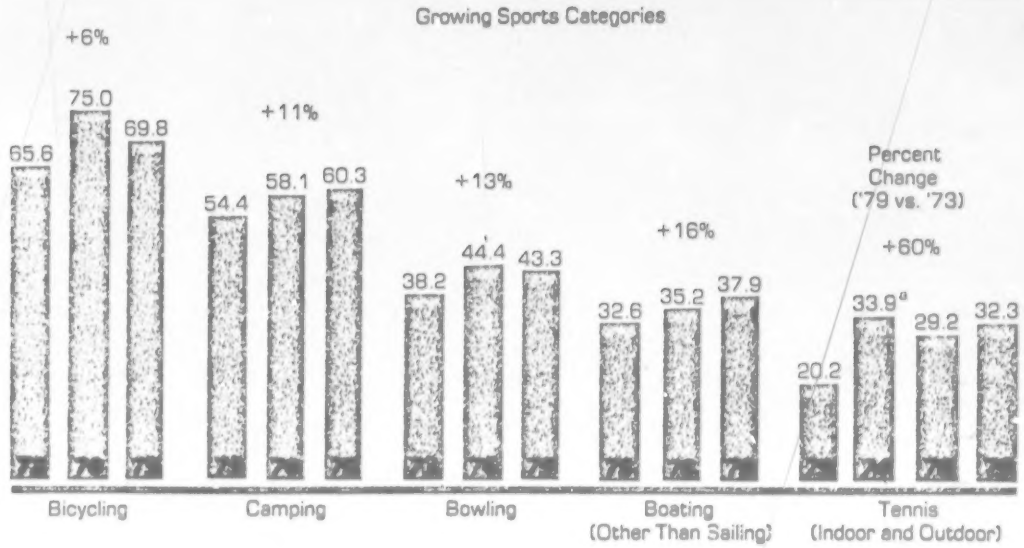
For the sport of tennis, there are four bars of projected survey information because of the special, in-depth study conducted in 1974. In the course of just one year -- from 1973 to 1974 -- the number of tennis players surged from 20.2 million to 33.9 million, then the projected figure retrenched somewhat to 29.2 million in 1976 and recovered well in 1979 to a level of 32.3 million participants. Overall, the 1979 projection represents a healthy increase of 60 percent for the tennis category when compared to the benchmark year of 1973.

FIGURE 1.-- **Trends in Team Sports — 1973 to 1976 to 1979 (Millions)**



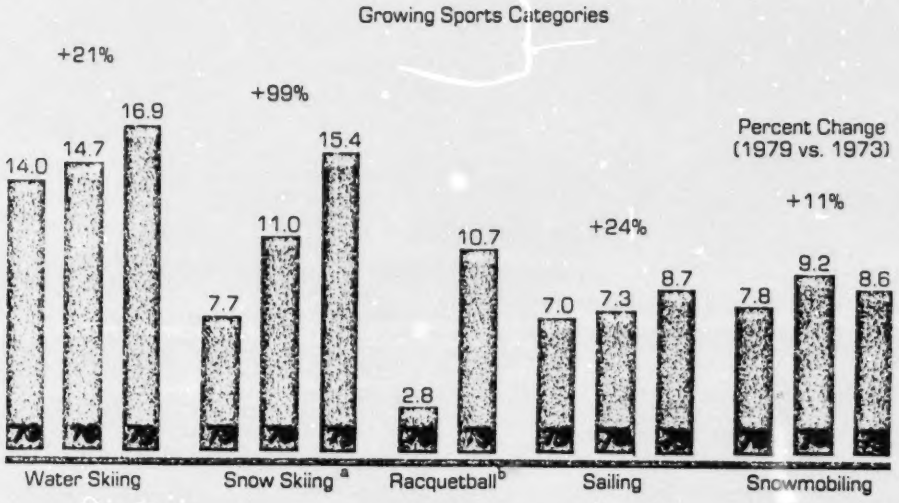
[a]Not measured in 1973 and 1976.

FIGURE 2A.-- **Trends in Individual-Type Sports — 1973 to 1976 to 1979 (Millions)**



[a]Special in-depth study.

FIGURE 2B.-- **Trends in Individual-Type Sports — 1973 to 1976 to 1979 (Millions)**



[a]Includes downhill and cross-country.

[b]Not measured in 1973.

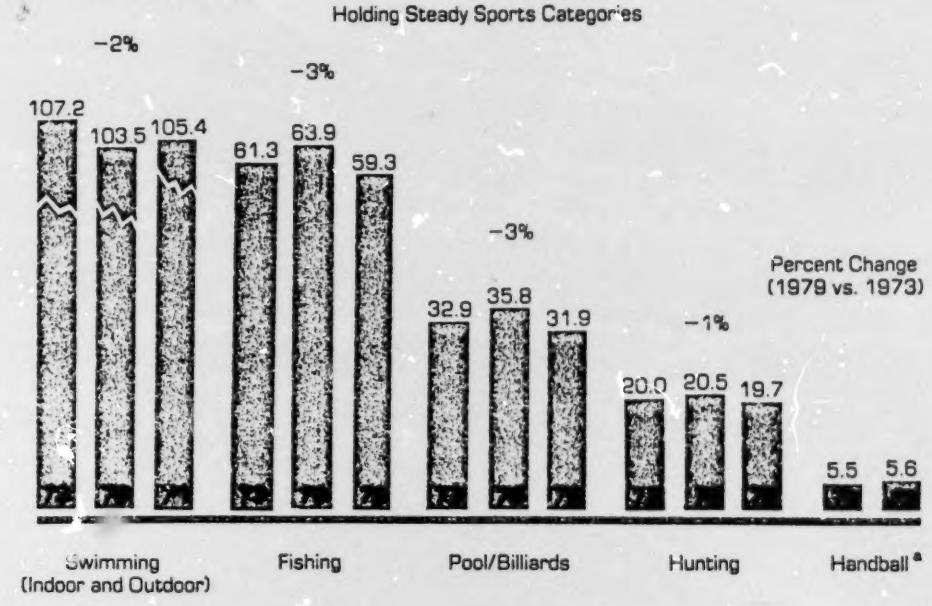
Without question, racquetball is the fastest growing sport of the 70's, with participation skyrocketing to 10.7 million players in 1979 from about 2.8 million fans in 1976. Snow skiing, which includes both downhill and cross-country, is number two in growth since 1973, going from 7.7 million skiers in 1973 to about 11.0 million in 1976 to 15.4 million in 1979--a 99 percent increase over the six-year span of time from 1973 to 1979. Water skiing and sailing represent two other categories with very respectable growth records.

Those sport activities that classify as "holding steady" during the decade of the 70's include swimming (both indoor and outdoor), fishing, pool/billiards, hunting, and handball (Figure 3.). Swimming, which holds the number one ranking in popularity, is a leisure time activity that has maintained consistently over the three surveys a level of over 100 million participants. Handball, a close relative of racquetball, has about 5.6 million players and this estimate is holding steady with the projected number of 5.5 million in handball participants as reported in 1976.

Among the declining sports (Figure 4), there are two categories that are down dramatically in number of participants. Table tennis, which currently claims about 27 million players, is off about 20 percent from the 33.5 million persons who participated in 1973; and ice skating, while increasing somewhat in number of participants from 1973 to 1976, has closed out the 70's with a substantial reduction to 18.9 million. The activities of golf, motorbiking/motorcycling, and archery are trending downward in the number of participants since 1973. Actually, the declines for these three categories are not all that dramatic; and since there is evidence of some stability, there are no doubt some observers who might choose to classify these activities as "holding steady" rather than positioning them in the category of declining sports for the decade of the 70's.

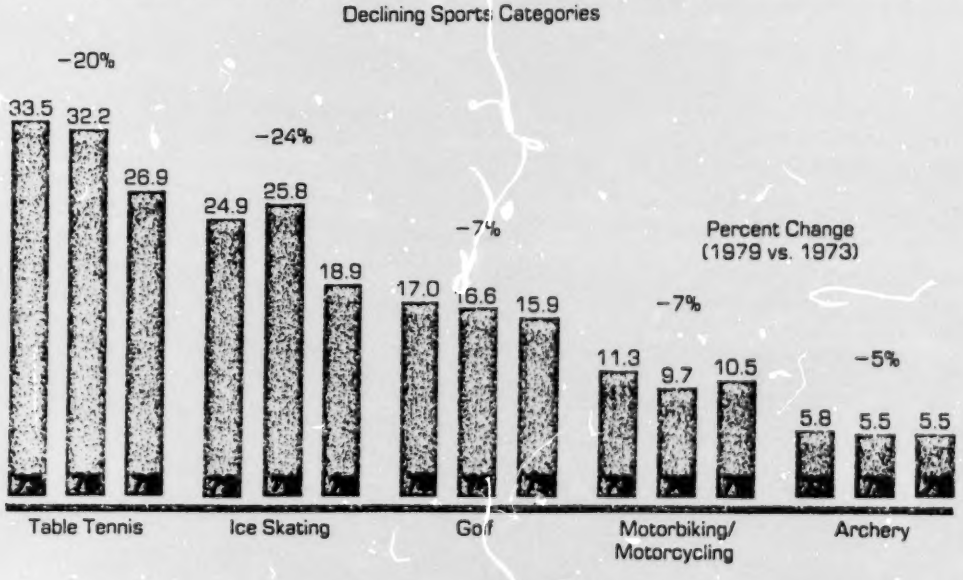
Our written reports on each activity contain the 1979 demographic profiles of the participants, as well as the demography measured in the studies conducted prior to the 1979 survey. This back data makes it possible to track the trends that have taken place in these demographic variables. Demographic shifts over time have enormous implications for business, in terms of developing marketing plans and designing marketing promotions and advertising targeted to specific audiences and/or population groups. Having an awareness of the demographic trends that are taking place over time, marketers can examine their significance and begin to make some judgements concerning their impact upon the future.

FIGURE 3.-- **Trends in Individual-Type Sports — 1973 to 1976 to 1979 (Millions)**



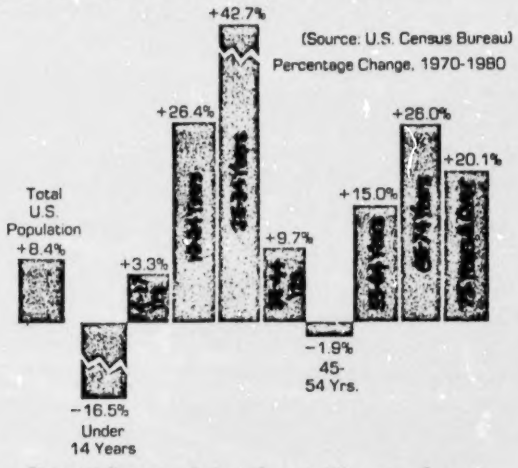
[a] Not measured in 1973.

FIGURE 4.-- **Trends in Individual-Type Sports — 1973 to 1976 to 1979 (Millions)**



In moving from the end of one decade to the beginning of another, several articles have appeared in newspapers and magazines dealing with the demographic direction of the population in the United States. These decade-to-decade comparisons are helpful in developing a perspective for future planning. For example, the United States Census Bureau provides us with age changes in our population that took place from 1970 to 1980 (Figure 5). During the 70's, the overall population of the United States increased 8.4 percent. The biggest upward shifts in population from 1970 to 1980 took place among those persons in the age categories of 18 to 24 years and 25 to 34 years. Since these age classifications also account for a high proportion of racquetball players, it can be concluded the age shifts had a significant impact on the growth of racquetball during the decade.

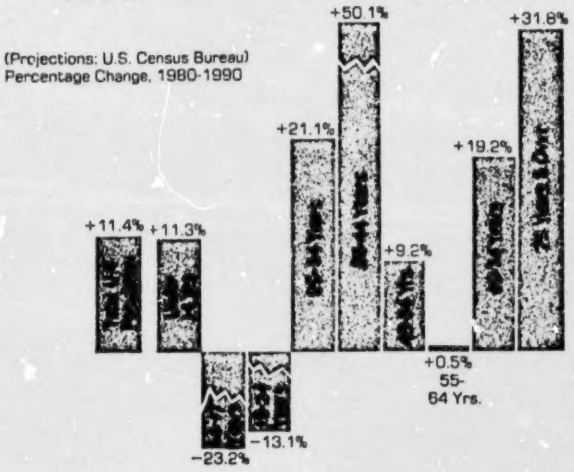
FIGURE 5.--**Population Shifts in the 1970's by Age**



Census Bureau data also tells us of a rather sharp decline in the number of children under 14 years of age between 1970 and 1980 (Figure 5).

Looking ahead to the decade of the 80's, as projected by the Census Bureau, it is expected the total population in 1990 will increase by 11.4 percent (Figure 6). Certainly one of the most dynamic age demographic changes of the 80's will be in the decline of persons between the ages of 14 and 24. The upward bulge in population for the age categories of 18 to 24 years and 25 to 34 years during the past decade moves up primarily to the age category of 35 to 44 years over the next ten years. Of course, the 25 to 34 year old group is still expected to increase in numbers by about 21 percent during the 80's. So, when relating the age shifts for the 80's to the age profiles of, let's say, racquetball players as we know them today, it would appear these age changes may continue to have a favorable impact on racquetball player growth during the early 80's; but this trend may begin to have a slowing influence at the close of the decade. Of course, at the same time, marketing of the sport of racquetball during the 80's may also change the trends in player profiles. If this player profile change was to be similar in nature to the age shifts that are expected to be upward, the net result would continue to have a favorable implication on the future of racquetball.

FIGURE 6.--**Population Shifts in the 1980's by Age**



The next major Nielsen Sports Participation Survey is scheduled for 1982. It is difficult to predict what directions the trends in participant sports will take during the early 80's. We all know there are several variable factors that contribute in one way or another to the increase or decrease in popularity of different sports. Certainly the worsening energy situation in the United States is going to have some adverse effects on trends for some sports while other participant sport categories will benefit. Inflation and its effect upon discretionary income can also have both negative and positive implications on growth.

It is reported that more Americans will have more time available in the coming years for leisure activities. In the minds of these consumers, a participant sport has an image based upon such factors as costs, skills required to obtain a favorable level of player satisfaction and supply availability. These conditions create competition between the sports to garner participants and, thereby, offer a vast array of marketing challenges.

As recreation planners and researchers, you are keenly interested in the supply and demand comparisons. Without question, it can be summarized by the old adage that the only constant is change. Certainly growth cannot be expected to happen by itself. Becoming more perceptive and gaining more knowledge about the recreation industry will provide insights to help in managing this change with even greater efficiency in the 80's.

RECREATION TRENDS - A FUTURE LOOK
"SO WHAT? - IMPLICATIONS FOR THE RECREATION PROFESSION"[1]

Roger A. Lancaster[2]

The art of "crystal-ball gazing" is not an exact science. While it is very useful to discuss what life will be like in the future, and rather fun, I might add, a review of the multitude of materials prepared 20 to 30 years ago about life in the 1980's found little that was all that accurate. The projections that were most on target tended to be those educated guesses about "things" - such as transportation devices, home products, recreational equipment, etc., plus those that could be projected from a specific, sophisticated data base such as demographic projections. The judgments on the future that tended to be the most off the mark were those that dealt with the intangibles - such as individual and societal attitudes. Much of the attitudes presented in Orwell's 1984 are certainly far from the reality of today, and it is doubtful if our current attitudes are going to change enough in the next four years to make Orwell's prophecies come true. This is to be expected, for the intangibles are very difficult to measure. Indeed, to measure changes in attitudes requires sophisticated, complex, long-term research. Most of us lack the time, money, and even inclination to engage in this type of research over an extended period. Perhaps some of the best research on this topic has been in the area of sexual behavior - the interest being generated, perhaps, by the joys inherent in the subject matter.

However, it is in this area of the intangibles -- the additudes, hidden individual behavior, the "human climate," as Philip Lesly refers to it - that the recreation and park profession is going to have to study more closely in the future. There is today a massive shift in the attitudes and posture of the public, and I quote Lesly, (1:2):

> The survival of all institutions depends on how this new human climate is managed. The only way anyone can have a say about the future is to learn to manage the human climate. Of all the factors that determine how our system works, the least understood is now clearly the most important--the people factor.

With this in mind, let me give a cursory response to the question that is the title of this talk in the program "So what?: implications for the recreation profession." If we can't manage the human climate; if we can't project and analyze future human climates; then all of the trend projections on the tangibles - the number of people who will be hiking, skiing, boating; the number of parks, campsites and amount of open space we will need; the amount of recreational equipment and number of RV's purchased - may not matter one iota. This is not meant to debase the need for understanding tangible trends; nor is it meant to demean the value of this symposium. What it does mean is that the future of the recreation profession, especially those in the public arena, will be very dependent on the ability of the professional to understand, analyze, and manage the human climate, not only of their own staff, but the public which they serve and to whom they are accountable.

At present, the ability of the recreation profession to deal with the human climate is very limited. We suffer from knowledge gaps. I see relatively few papers on this topic in the program; we lack the skills. Few professional preparation programs deal with this topic in a meaningful way. While we say we are in the "people" business, in reality we are more concerned about carrying capacity, numbers of people participating, grass, trees, and buildings; the tangibles which we can touch and see, and are the easiest to manage.

Yet, there are series of trends and issues today which over the long-term (the next 20 to 30 years) will force us away from dealing with only the tangibles if we want to survive as a profession. While some of these issues might be considered in the "tangible" domain, all of them affect the "human climate." Time does not permit me to go into depth on all of them; however, I do want to spend some time on at least three of these issues.

---

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2]Director of Research. National Recreation and Park Association, 1601 Kent Street, Arlington, VA.

The first of these is an overwhelming conservativism that I see sweeping throughout the land. The shift in political posture from the left-of-center to the right-of-center is manifested in such recent events as:

- the "back to the basics" movement in education;
- the refusal by many states to consider the ERA, and a rescission in some states of the Amendment;
- the growing anti-abortion movement;
- the current "Jaws II" initiative in California and the Proposition 13 syndrome, which I see extending to many other states and cities in the upcoming elections;
- the resurgence of the Republican Party led by a presidential candidate who epitomizes conservatism; and,
- the current attempts by the Carter administration to balance the federal budget by slicing billions out of social programs, including parks and recreation.

The fiscal constraints engendered by such conservatism strikes right at our ability to provide quality recreation and park experiences to the public whom we serve.

The root cause of this conservatism may be what I would call a "me first" syndrome. A syndrome which we have not seen in this country for some time and one which has led to lessen the value placed on social programsmore than any previous time in this century. The idea of being my brother's keeper, providing services for the public good, and just about anything that resembles a social welfare program, including recreation, is now falling on deaf ears. The taxpayer is revolting; he is more interested in himself than the other person, and if such attitudes continue, then at the risk of being a see'er of doom, I do not see much light at the end of the tunnel for public park and recreation services.

The fiscal conservatism of the "me first" attitude will affect public recreation and park systems in two basic ways. The first is that we are going to be asked to do more with less money and when you combine that with the effect of the energy situation, where more and more people are going to require more and more recreation and park services closer to home, we are being put between a rock and a hard spot. Secondly, the "me first" attitude plus the overwhelming desire of decision makers to improve the economy is going to create some extremely tenuous conflicts on the use of any available open space that we have. The search for new energy sources on existing parkland, the use of land for industrial and commercial development rather than open space and parkland, are going to be battles that we in the park and recreation movement are going to have to face square on, for land lost in such short-term skirmishes will be lost forever.

How recreation managers deal with this aspect of the human climate in the future is open to much discussion and debate. What is known, is that if we had been able to foresee the implications of this shift and adjust our management style accordingly, then we might not have found ourselves in such a dire predicament.

The second major issue is one that I've already mentioned in passing - the energy crisis. While this might be considered a "tangible" factor, it does have an "intangible" tinge that will impact on the human climate.

We know that our oil supply is running out; it is not an unlimited resource. We can be relatively certain that in time there will be regulations and restrictions placed on the use of petroleum products. Indeed, it's entirely possible that energy-consumptive forms of recreation, such as all of RV's, may be among the first affected. We also know that alternative energy sources are currently available or are technologically feasible, but are not economically feasible. These are all tangible factors.

The intangible factors revolve around people's behavior in times of the reduction of petroleum-based energy. The role of the recreation professional in managing the human climate under such conditions is two-fold.

First, the recreation professional will, like everyone else, be expected to take a part in conserving energy. Undoubtedly, there will be mandatory conservation measures imposed on from high. However, I am convinced that only through modifying human behavior will this nation ever reach the point where it has an effective energy conservation program. To this end, the recreation professional should be taking steps to modify the behavior of his/her staff in terms of energy conservation education. As such, the recreation professional has a responsibility to utilize these resources to modify public behavior towards energy consumption.

The second intangible factor related to the energy crisis has to do with people's leisure behavior. I firmly believe that in spite of reduced energy resources in the future, people will still search for outdoor recreation experiences. What will change will be the mode they use to pursue these experiences, and the settings in which they take place. Many of these changes have been discussed during this symposium, and must be heeded by the profession, with due caution

given to short-term "fads."

Of greater concern to me, however, is the fact that as people find they cannot escape to the Minnesota backwoods to enjoy hiking, they will turn to settings closer to home, but with the same set of expectations as to what they should receive from the experience as they previously had in their trip to the backwoods. Obviously, the dilemma posed by this situation may never be able to be fully resolved. Yet, the greater the ability of the professional to manage the human climate, the closer he/she will come to a solution.

The third major issue that I see developing is that of a changing clientele. A look at almost any demographic statistical analysis shows that we are becoming an older nation. The children born in the baby boom of post World War II America are now rapidly approaching middle age and by the end of this century will be counted among our senior citizens. To top it off we have almost reached the point of zero population growth, and if you combine this factor with the prospect of many of us being senior citizens in about 30 years, then we are faced with a society that is much, much older and as a result will have many different needs than the society of today. An implication of this for the recreation professional is that the services we provide will, as a result of the changing character of our society, be quite a bit different than what we know today. For example, it is possible that many of our high risk programs will no longer be in vogue. Then many of our more strenuous outdoor recreation pursuits, such as mountain climbing, may decrease in popularity simply because fewer people are capable of either physically or economically pursuing them.

Along with an older society will be a more highly-educated population. A college education is now becoming the general rule rather than the exception. But, along with the obvious benefits of a higher education, come some pitfalls which will become more apparent in the future and have some definite implications for the recreation professional.

We have been taught in our society that a college education will bring certain rewards. It is the epitomy of the "Great American Dream." However, in an era of limits and shortages, the mass overbuilding of expectations is running on a collision course with those institutions who simply can't produce. The feelings of entitlement generated through raised expectations is leading people to take matters into their own hands. It is part of the "me first" syndrome mentioned earlier and may account for the self-fulfillment of expectations through shoplifting, embezzlement, and other antisocial acts. It also is leading to a complete distrust of our social institutions, especially government, and is resulting in more and more power groups making claims on whatever resources are available. Each of these power groups is clamoring for top priority and is using its weight and voice to claim essentiality.

The implications of this situation to the recreation profession are again perhaps best stated by Philip Lesly. In this setting of priorities and struggle for power, he believes: (1:6,7):

> The police forces will be maintained, fire protection will continue, the streets will be kept free of garbage and rats, the schools will be kept open, water will be pumped and the transit system will operate unless our society collapses. But as of now, the public does not see such a grim necessity for maintaining (public park and recreation) budgets or allocating gasoline and fuel oil to keep the parks and playgrounds open or enable people to reach them. Life without outdoor recreational facilities and music and libraries may become grim and heartless, but that is not as evident as how savage life will be if the forces are denied that now demand their exalted expectations be fulfilled.
>
> The result - - on the course we are now heading - - will be that the elements having little visible power or clear-cut value to society will not only be outpaced, but may be squeezed out of existence.

To bring a very current perspective to this issue, let me quote Amitai Etzioni, a professor of sociology at Columbia University and currently a senior advisor to the White House (2:54):

> America is in the midst of a grand dialogue. We are choosing between a reindustrialized society and one emphasizing quality of life, in which greater understanding of self, of relations to others, and more communing with nature are stressed.
>
> If we opt for quality of life, we will gradually lose our economic strength until in 10 or 15 years we're going to be like a South American country; we will become a "siesta society" in which there is less drive and less productivity. There are signs of this now. Our railroads, bridges, and highways are deteriorating and look ever more like those in Latin America.

> If we choose to reindustrialize, then we will be able to come to grips with our number 1 problem: the loss of productive capacity, which lies behind inflation, lack of adaptation to the energy problem and other ills.
>
> As things stand today, one of the weakest voices is that of public recreation and parks. It is becoming starkly clear that unless your group quickly establishes its essentiality, you face a grim spiral of decline. The human climate is rapidly turning against you and your capacity for influencing it is eroding. You may be running out of time to establish your your case while all around you others are shouting and making it harder for you to be heard.

There are many in the audience whose response might be - so what; let the private sector take over, they can do a better job!

My response to these reactions is that while I welcome more involvement by the private sector in the provision of recreation and believe strongly in private/public cooperation; I am not convinced that we can totally relegate all leisure services to private industry. It must be remembered that the prime objective of private enterprise is to make a profit, and like any other business, those products that don't sell are pulled from the shelves. Yet, it might be these very same products that are vital to an individual's leisure needs. Nevertheless, if we don't heed what Lesly says - if we don't learn how to deal with the human climate - then the only option that may be open to public recreation and park agencies is to turn everything, including research, over to the private sector.

These, then, are just a few of the major issues that I see confronting us. While most of the issues are with us today, the cyclical nature of life leads me to believe that such issues are trends that we can see increasing in importance over the next quarter of a century.

How will the recreation professional be able to cope? Let me close with some random thoughts:

1. The "me first" syndrome is not necessarily bad. Indeed, the striving towards individuality, if accompanied by leisure literacy, could lead to the ultimate goal of the recreation professional - to work himself out of a job. Such literacy will only come about, however, if the professional views his role more as a facilitator, enabler, and educator rather than simply a provider of opportunity.

2. The recreation professional must become more in tune with the social issues of the time and their implications for the provision of future leisure services. In this light, such tasks as long-range planning must begin to take into account not only the tangible factors, but also the intangible aspects of the human climate.

3. The recreation professional must begin now to justify his existence and essentiality in more human terms. This will involve, among other things, an evaluation and analysis of leisure services and leisure experiences relative to their effect on the individual, and their effect on the economy, health, and productivity of society.

Finally, while it may appear that I've painted a picture of gloom. I don't want to appear as if all is lost. Indeed, such social trends may provide us with the opportunities to be the creative individuals we think we are. Less federal money may force us to be more creative in establishing linkages with the private sector. Less staff may force us to be more creative in using volunteers, a growing leisure experience for many people. Less facilities may force us to be more creative in identifying and using the unidentified public and private resources that exist in our communities.

LITERATURE CITED

Lesly, Philip. "The People Factor and the Crisis of Confidence," a presentation to the 1976 NRPA Congress, Dallas, Texas. 25 pp.

"A Conversation with Amitai Etzioni: Is the U.S. About to Become a 'Siesta Society'?", U.S. News and World Report, Vol. LXXXVIII, No. 14, April 14, 1980, p. 54.

OUTDOOR RECREATION TRENDS IN THE 1980'S
SO WHAT? - IMPLICATIONS FOR SOCIETY![1]

Carlton S. Van Doren[2]

INTRODUCTION

My purpose today as the last speaker is twofold. I have been asked to summarize the many excellent presentations we have heard during the previous two days and to be a spokesman for society's viewpoint. It is my intent to challenge you. I hope to draw your attention to some implications concerning outdoor recreation trends in the 1980's that I foresee in this time of continuous societal change.

T. S. Eliot said, "The future has many cunning corners" and a traditional Japanese saying admonishes, "If you talk about the future, even the demons will laugh." In spite of these cautions concerning prognostication, the implications to society may really be, So What? Why? Because I have to question if our trends, based on data compiled in the 1970's, have really allowed us to recognize that we have moved into a new post-industrial era of leisure. I firmly believe that once in a while a look at events, attitudes, and philosophies of the past assist us to place the present in a better perspective. The intent is to develop a spirit of creativity and a sense of the past that will enable us to ponder the future.

The major question facing us today concerns our human attitudes toward work and leisure. In the words of philosopher Eric Hoffer, it is the "centrality of the human factor that makes industrial societies at present so unpredictable." Currently, we are riding a crest of a leisure/travel/recreation spending panic, an attitude of, do it now, because tomorrow we may not be able to! As individuals, we are uncertain as to what the future holds for us. Our society has mixed emotions about the future. This is understandable if you stop and think about the changes that have affected our lives in the last two decades. In the 1960's, we focused on genuine concerns for racial inequality, poverty, and environmental pollution. As we moved into the 1970's we were involved in a war in Southeast Asia with confused, mixed commitments and emotions. Our president at that time successfully disengaged us from this unwanted war and then proceeded to deceive us with an event called Watergate. To provide a capstone to our frustrations we then moved immediately into a national and worldwide energy crisis with its attendent, insidious monetary inflation. In addition, Third World changes are emotionally draining our society. It is difficult learning to cope with continual change.

These events, the "Future Shock" of Toffler, have caused us to momentarily lose our confidence, question the future, and have created a focus on the present. We made questionable progress in handling our problems of racial and sexual inequality, poverty, crime, and pollution. But our confidence in our social, economic and political institutions and in our expectations of a better quality of life are questionable. Society is regrouping. We are questioning whether our governmental institutions can really solve our problems or that people can influence government. At the same time we are frantically seeking to exploit our American dreams before we awaken to find some of them are no longer possible. We have shifted from an American trait of deferred gratification to almost panic consumption of goods and services. Some have called this instant consumption a new American ethic. Monetary savings, family stability, and conscientious work habits are not fostered by such "gusto" consumption and actions.

The March, 1980, issue of the Newsletter of the Texas Tourist Development Agency contained an interesting article about our conspicuous consumption. The newsletter related a study by the Barton, Durstine and Osborne Agency showing that Americans put vacations first on a list of ten luxury items. The luxury list with items in order of importance included: vacationing, dining in expensive restaurants, purchasing expensive cuts of meat, cosmetics, sporting equipment, household furnishings, alcoholic beverages, major appliances, clothes, and movies. Some of the trends in outdoor recreation discussed at this symposium support this survey.

Trends in the private sector of the recreation/travel/tourism industry also support the above priorities. The 80's are touted as the

---

[1]Paper presented at the National Outdoor Recreation Trends Symposium, Durham, NH, April 20-23, 1980.

[2]Professor, Recreation and Parks Department and Texas Agricultural Experiment Station, Texas A&M University, College Station, TX 77843.

"Travel Decade." Emergent life styles seem to favor recreational travel. Travel is considered a right, not just a privilege. The Big Picture, a major annual publication in the travel industry, states that in 1979 U.S. travelers spent $126 billion on trips to places 100 miles or more from home. This is more money than is spent for clothing, automobiles, and for national defense. Only food, housing and income taxes, according to The Big Picture, exceed travel expenditures.

Is our society on a leisure, recreation, travel binge because we do not have confidence in our future? Quite the contrary, we are consuming these goods and services because we see a retrenchment in the future and a necessity to change our habits, desires, and values. The implications for society in this new leisure era can best be described by a brief analysis of the eras of leisure/recreation during the last century. I am indebted to my faculty colleague at Texas A&M, Clare Gunn, for providing the initial effort in describing these eras.

This historical perspective is provided in Figure 1 in the form of what the Hudson Institute might describe as an "analytical summary." The four eras are entitled: High Society - 1860-1920; Mass Recreation - 1920-1958; Mass Mobility and Transcience - 1960-1974 and Post-Mobility Adjustment - 1974--. Each era has ten variables or elements that focus on the key events or philosophy of the period. These ten variables are Population Characteristics and Trends, Personal or Societal Philosophy, Time for Recreation, Income, Recreational Activities and Equipment, Political Actions, and Evolution, Public and Private Organization for Leisure, Advances in Technology and Communication, Mobility and Facilities and Services. A study of these four eras of leisure/recreation provide us with an enlightened historical perspective that assists our analysis of the present and casts some light on the near future.

Brevity forces me to concentrate on the present era, Post-Mobility Adjustment. This era was initiated by the first energy crisis in 1973-74 and its effect on the economies of the industrial world has been evolutionary and identifiable. An analysis of the variables currently evolving leads me to believe that some major and minor adjustments in society's leisure patterns can be suggested. The key variables that will have the largest impact in the short term are money (inflation) and mobility (energy). These two variables are intimately tied together and impact the remaining eight variables.

Population Characteristics and Movement

The population of the United States has increased by more than three times in the last 120 years. There is evidence that the population explosion of the post World War II years has leveled off. In 1978 our growth rate was less than one percent. This means that the population pyramid for the next decade can be analyzed with some degree of certainty. Our predominantly urban nation will grow older with the largest group in the middle aged brackets, between the ages of 25 to 45 years. This group may continue the same outdoor recreation habits pursued when they were younger, but it will be more affluent which may modify spending and travel habits. Persons in the older age brackets up to 65 years will increase by ten percent. They will also have more disposable income and with a continuation of early retirement, possibly more leisure time. The elderly over 65 years are projected to increase at twice the normal growth rate, as life spans increase. This group may be less affluent, but I believe we can project that a large number of these people will migrate to the Sun Belt if at all possible.

The Sun Belt's attraction is not only for retirement, but for economic advancement and opportunity. There is evidence that energy resource rich states in the Mountain West will share the Sun Belt growth. Wyoming today is an excellent example of energy inspired growth. Growth of this type will in some areas force society to express a choice between energy exploitation and natural resource preservation. In many cases, I predict energy will be the winner initially with a gradual shift by the 1990's to the preservation approach as we either develop new energy technology, change fuel sources or reduce our energy utilization.

The suburbs will continue a slow growth rate, but inhabitants may have to settle for fewer public social services as taxes are converted to use for essential services. Smaller communities in a rural setting will see some rebirth as a portion of our populace seeks a more conservative, frugal lifestyle. These communities will usually be in areas with distinct climatic and physiographic appeal, many adjacent to large public recreation areas.

Some of the center city population growth will continue where local leadership continues to organize with industry to accomplish major inner city restoration and reinvestment. Atlanta and Detroit may be two of the better examples of this process during the last decade.

Personal/Societal Philosophy

Our philosophy toward leisure, recreation, and travel has changed dramatically since the first High Society Era. Leisure activities are now considered a right for all, not just for the affluent upper class. The 1980's will continue as a period of growing self-actualization and improvement. The "me generation," as it grows older and matures, will constitute a very assertive and vocal public. As consumers, society in the

FIGURE 1.-- SIGNIFICANT EVENTS BY RECREATION/LEISURE/TRAVEL ERAS

VARIABLE	HIGH SOCIETY 1860-1920	MASS RECREATION 1920-1958	MASS MOBILITY - TRANSCIENCE 1958-1974	POST-MOBILITY ADJUSTMENT 1974 --
POPULATION CHARACTERISTICS TRENDS	Rural N.E.-Midwest 50 million People	Rural--Urban Suburbia-West Coast 130 million	Urban-Nucleated City-70-75% of Pop. Sun Belt Growth 200 million	Central City-Small Town Growth - Rural 242 million (1990)
PERSON/SOCIETAL PHILOSOPHY	Nuclear Large Fam. Puritanical Work-Ethic Self-Denial	Family-Smaller Leisure Recreation Emergent A Privilege To Enjoy Leisure	Single Parent Family Self Gratification - "Me" Generation Minority Actions Changing Role of Women-ERA	Leisure/Recreation-A right-Lifestyle Individual Awareness Self-Actualization Self-Improvement
TIME	60 hr.work week Sunday Free	50 hr.week Saturday Free Paid Vacation	40 hr.week 3-Day Weekends	38 hr.week "Moon lighting" Do it yourself home repairs
INCOME-MONEY	Hourly Wages	Salaries	High Disposable Income Era of Credit 2 Income Families	Inflation Zero Growth (?) Cost Consciousness Electronic Money
ACTIVITIES AND EQUIPMENT	Church Centered Bicycle,Golf,Tennis	Family Centered Improved Equipment Boats,Camping,Equip.etc.	Social Group Specialized Activity/Equip. ORV'S Back to Nature Movement	Electronic Games Human Energy Physical Fitness High Risk Sports
POLITICAL ACTION	Conservation/Preservation Leadership-Management of Natural Resources	Environment Management for Public Use	Reactionary Leadership Environmental Awareness-Ecological Ethics - Congestion In Parks	Public Involvement Leadership Localized Congestion
PUBLIC/PRIVATE ORGANIZATION	Professional Sports Public Recreation Movement City-National Parks, Amusement Parks	Amateur Sports State Parks TVA-C of E Regional Parks	Disneyland-Theme Parks Mission 66 Individualized Travel	Airline Deregulation Tour am Caucus Package Tours
TECHNOLOGY & COMMUNICATION	Photography Movies-Wireless Mass Production-Literature	Radio-Television Plastics-Super Alloys Air Conditioning Computers-Electronics	Instant Photography Satellite Communications Computer Management	Videophone Cottage Electronics
MOBILITY	Coal and Steam Railroad,Ship,Mass Tr.	Automobile Airplane,Small Group Tran.	Interstate Highways Rec.Vehicle,Sub-sonic Aircraft	Supersonic Travel ? Mass Transit ?
FACILITIES/ SERVICES	Luxury Hotel/Resorts Second Homes-Wealthy Overseas Travel	Hotels Second Homes,Mid.Class	Private Campgrounds,Lodging Franchises,Fast Foods,Full Service Campgrounds	Family Camping,Time Sharing Cruise Ships,One Stop Vacations Family Camp.,Reserv.to enterparks

1980's will demand quality goods and experiences, including that portion of disposable income invested for leisure/recreation/travel. In some instances, "Nadarism" will manifest itself in our industry and be directed at both the public and private sectors.

There is a possibility that an assertive society will increase as the private sector continues to move to specific product differentiation and customization in order to market goods and services. As these submarkets gain in popularity for the middle and upper income levels of society, the less affluent will look to public resources to meet their demands. One maxim seems to hold true throughout all the eras of leisure/recreation/travel -- the consumption of the wealthy (yesterday's jet set) is constantly emulated by the masses in terms of activities and spatial location. As an example, I need only to remind you that thirty years ago, skiing, golf, and tennis were essentially rich men's sports and Miami Beach and Las Vegas became profitable resorts, initially, by spending from upper income groups.

Managers of public resources will continue to be pressured by consumers of the submarkets now being sold by the private sector. As an example, the Travel and Tourism Executive Newsletter (March, 1980), contained information on the backpacker submarket quoting an Adventure Travel Magazine study that the median age of backpackers is 33; income $28,000 per household; 89 percent are college educated; 60 percent are in managerial-professional occupations; and 62 percent own their own homes. They spend $2,300 and travel 35.8 days a year, averaging 6 trips. These are the wilderness buffs in our public parks and forests. Not all are this affluent, but an estimated 10 - 25 million hikers, if they decide to assert themselves, may be very effectual in bringing about their desired managerial changes.

In the past, the strongest influence on leisure participation has been the family. The family group will continue to exert a strong influence in the next decade; however, changes can be expected. Later marriages, fewer children, and single-parent households will bring about real shifts in recreation activities, and the times and locations of participation.

Time

During the first three eras, the work week was substantially reduced from 60 hours to 40 hours and the paid vacation became common. The work week in the future should remain at 38-40 hours with the introduction of Flex-time as described in Toffler's recent book, The Third Wave. Inflation will encourage mini-vacations and continued extended weekends of leisure activities. The shrinking value of the dollar may also encourage second jobs and more part-time employment as well, thus, for some in our society a reduction of leisure activities in an outdoor setting may be time prohibiting. With less leisure time, home recreational activities will increase.

Income

Our nation during the last decade may have reached a peak in the distribution of personal income. As we begin the 1980's, one word - - inflation - - immediately captures our individual interest and sometimes our anger. Disposable income has traditionally been a good indication of the amount of leisure expenditures and activities. The facts seem to be that this income is stable but probably declining. There are increasing conflicting signals of a "spend now" attitude offset by a "waste not" and frugality attitude. Nevertheless, there is an inertia in human society that dictates the continuation of spending habits to a point that the price is too high and the pocketbook is closed. Society, in some instances, is beginning to question the costs of goods and services. Hard choices are being made, discrimination in expenditures are evident and the quality of a purchase questioned. These are the implications for the 1980's.

Figure 2 provides a schematic overview of some economic indicators. The Travel Price Index, compiled by the U. S. Travel Data Center in February 1980, was 270.9 (1967=100). This was an increase of 25.1 percent since February 1979. The Travel Price Index (TPI) is a composite index consisting of the cost of food away from home, lodging, transportation and other goods and services purchased while away from home. The transportation component of this index includes air fares, inter-city train and bus fares, and the cost of gasoline. The Consumer Price Index of all items, after an increase equal to the TPI until mid-1979, indicated a reduced growth rate and only increased 14.1 percent between February 1979 and February 1980. The percentage of disposable personal income in the United States has shown a consistent decline from a high of 7.8 percent in 1973 to less than 5 percent in 1979. Real disposable income between 1967 and 1973 increased 17.5 percent, but between 1973 and 1979 growth was reduced to 5.5 percent. The implications of these indicators help to explain the mixed spending of society and the recent actions to curb credit in our electronic money era. The TPI is having, and will continue to have, a profound effect on leisure mobility.

One encouraging fact amid our struggle with domestic inflation is that the United States is a travel bargain for foreign visitors. If this continues in the 1980's, it does have implications for our most prominent public parks. We can expect increasing foreign visitors at sites in the vicinity of the major gateway cities such as New York City, Miami, Houston, Atlanta, San Francisco and Los Angeles.

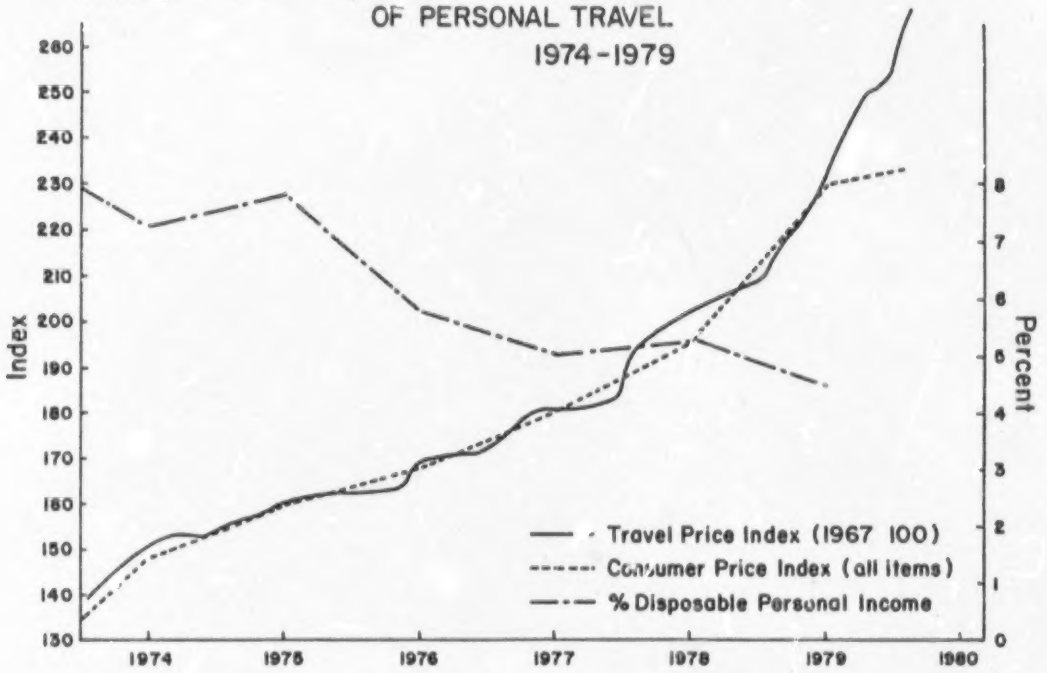
Activities and Equipment

President Carter's Federal Energy Conservation Plan, if initiated, is devised to reduce leisure travel and certain energy consumptive leisure activities. His proposal for a vehicle sticker plan restricting the days on which car drivers could purchase gasoline would have an obvious negative impact on recreation. Households would be forced to select weekend days for recreation which, in effect, could constitute a weekend gasoline ban. The proposal for a compressed work week could either negatively impact recreation activities or possibly encourage home centered activities. The proposed ban on the use of recreational boating seems unrealistic as a conservation measure and will probably not be implemented. The recreational boating industry has claimed that only one-half to 1 percent of all gasoline consumption is used by the recreational boater.

Inflation, energy cost, and energy availability will undoubtedly cause an evolutionary change in leisure activities and the use of equipment in the 1980's. There will be less driving for pleasure, and a continued focus on human energy leisure activities such as hiking, bicycling, cross-country skiing and sailing. According to the Michigan Department of Natural Resources, sailboats on Lake Michigan accounted for 26 percent of the transient boating population in 1973. In 1979 sailboats accounted for 52 percent of the population (Michigan Natural Resources Magazine, 1980). Eric Hoffer's statement that with "the exhaustion of raw materials and sources of energy, society will turn to creative energies of the people" may manifest itself in leisure pursuits. New sports such as wind surfing and wind skating may be examples and such high risk sports for some will be even more popular. It is very evident that backyard and close-to-home (local and regional) facilities will receive more use pressure during the coming decade.

We can also expect to see more consumption of activities provided by the private sector and an increase in some activities supported by the public sector. Bowling may increase once again and theme parks will continue in popularity.

FIGURE 2. --SELECTED ECONOMIC INDICATORS OF PERSONAL TRAVEL 1974-1979



SOURCES: Travel Price Index from U.S. Travel Data Center, Washington, D.C.
Consumer Price Index - U.S. Bureau of Labor Statistics
Disposable Personal Income - Survey of Current Business

Shopping centers will increasingly become centers of both passive and active leisure pursuits. There will be pressure to increase public support for the cultural arts and handicrafts. The astute public recreation manager will be one who facilitates cooperation and coordination with the private sector. Leisure services on school property and on other public properties not previously utilized for leisure activities will increase in this decade.

The sale of expensive recreational equipment, such as recreation vehicles and boats will remain in a temporary slump. Sales can be expected to increase as smaller, more energy efficient equipment is marketed in a few years. For those currently owning recreation vehicles and outboard boats, the sunk cost of the past investment will either force a sale of the equipment at considerable loss of money or the use of the equipment will continue on a time sharing basis. Are we prepared for ORV's to come to our public facilities with not just one family, but possibly two or three families, with a desire to not only park the vehicle but pitch a tent or two on the site as well? In the Rio Grande valley of Texas, winter visitors are leaving their trailers or recreation vehicles in the valley this spring and are driving in small cars or flying back to northern homes.

Political Action

An assertive society has already forewarned us of the action that we can expect on the political front in the next decade. Special interest groups will grow stronger. Tax cutting at the state and local level, such as California's Proposition 13 and the current Jawz II, simply means that competition for public funds will increase. Some governments will consider recreation as non-essential. Financing and managing public facilities for leisure will have to come from new funding sources. More pay-as-you-go fees are on the horizon. A public park is not a free good any longer and I doubt if it ever really was such a good. Creativity, innovation, and compromise will be the key words to successful public recreation facility development and management. Lessons can be learned from the private sector in terms of efficiency, flexibility, automation, and public facility marketing. There should and probably will be more public and private cooperative development of recreation sites forced upon government by a demanding public.

Public/Private Organization

Coordination and cooperation between public and private institutions providing goods and services in leisure may be more prominent during this decade. Increased competition for the leisure dollar, rising costs, and public sentiment for quality experiences may foster much quasi-public organization.

Social-cultural constraints to planning are well documented and include definite time lag trade-offs with special interest groups and a past resistance to government control and regulation (Kaczka and Schleusner, 1980). The 80's should see decentralized government involvement in recreation with local leadership and public involvement. Organizations and institutions having direct appeal to society will be the ones that promote quality experiences, outstanding service, value, and satisfaction. Rising transportation costs will provide one avenue for public/private cooperation in local mass transit and for package tours in order to gain access to public recreation sites.

Technology and Communications

Our growth in technology and communication has been a mixed blessing to leisure. We are probably one of the most well-informed nations in the world. Mass communication has made us aware of the beauty of our country, of natural catastrophies, and of evolutionary events. Recently, we have all followed the eruption of Mt. St. Helens and some people in the northwest have endangered their lives and the lives of others by a desire for a closer look. The irony of our technology, particularly in the public sector, has been our inability to harness our resources to continuously monitor outdoor recreation activities. Our data collection procedures at best have been sporadic. In addition, technological growth seems to create new environmental problems that have a direct bearing on the natural resources of our recreation areas.

The next decade may fortunately bring with the financial belt tightening better data collection and hence better planning by the use of technology such as computer simulation. We may even witness increased social engineering through better public relations by public agencies and successful attempts to reduce peak period congestion by informing the public of alternative recreation sites.

There is little doubt that the consumer will become, as a result of better communications, very well informed and will increasingly scrutinize public and private policy decisions directly affecting his leisure time and expenditures. Comparison shopping for leisure experiences will result. Technology and communications will force the leisure service manager to maximize his revenue cost per visitor, whether in the public or private sector. The consumer likewise will evaluate his experiences in terms of both psychological satisfaction and economic outlay.

Mobility

Never, in the historical development of our leisure growth, has recreation system accessibility been a more important consideration as in the 1980's. A major implication for a society in pursuit of leisure experiences is, at this point, dependent upon where people live and the extent of their mobility. The immediate future of outdoor recreation trends depends upon our understanding of people's mobility and their space adjusting behavior.

In the United States, 81 to 84 percent of all our transportation is based on the automobile and truck. We have become dependent upon the automobile for both business and pleasure mobility and the cost of gasoline is considered paramount by many in society to individual and family health and well-being. The automobile is a symbol of our affluence or frugality and definitely of our individuality. When we are informed that the cost of gasoline increased 67.9 percent in 1979, we are a psychologically shaken and somewhat threatened society. We realize that fuel at subsidized prices has essentially been a free good and now the handout has been suddenly and somewhat brutally withdrawn. We are beginning to husband the second most expensive possession in a majority of families; the automobile. Some may even trade down to a smaller automobile to obtain fuel efficiency, being reluctant to lose mobility.

During the fuel shortage in the spring and summer of 1969, we looked to other methods of mobility. We turned to a dying mode, Amtrak, and filled trains to capacity. In the Northeast Corridor, where the passenger rail system was more efficient and developed, area gasoline consumption was 23 percent less per capita than anywhere in the Nation during the first half of 1979. Some chose the airplane and in spite of air fare increases of 33 percent between February 1979 and February 1980, there were 47 million air trips, during the fourth quarter of 1979. During this quarter, air transportation's share of total travel was 18 percent, the highest level for the year (U. S. Travel Data Center, April, 1980). According to the U. S. Travel Data Center, more than one-half of these air travelers were on vacation trips. It is little wonder that with aviation fuel selling for as much as 95 cents per gallon, compared to 35 cents in 1978, that this industry's fuel costs were more than 11 billion dollars in 1979. Alternative transport modes to the automobile may be a short term solution for us, but fuel price has become a major constraint to everyone's mobility. Mass transit will, of necessity, be more prominent in the future decade. Buses, for example, can claim 240 passenger miles to one gallon of fuel and operate for as little as 3 cents per mile.

The automobile costs upwards of 21 cents per mile and trains, 9 cents per mile.

The implications of the mobility variable include the increased use of recreation sites near residential areas, primary local and regional sites, car-pooling for leisure/vacation trips, longer stays at specific sites, and probably overt public policy to encourage mass transit to all sites.

Facilities and Services

The President of the Marriott Corporation recently stated that the $100 a night room was not very far off. It is obvious that the price of lodging will have an effect on the use of outdoor recreation areas. With commercial lodging very expensive, family travel in the 1980's will probably mean a substantial increase in camping. Campers in our parks and forests will want to settle in for long stays and they will want a variety of services that public facilities may not be providing at present. Some campers will opt for the commercial campground because it provides the amenities not found at a public site. These campers will still visit the public recreation area.

Second home construction in the vicinity of outdoor recreation areas will cease, if it has not already done so. The owners of these second homes, in order to maintain them, will probably resort to time-sharing arrangements with friends or relatives. Nearby recreation areas will consequently receive new visitors perhaps unfamiliar with our parks and forests.

Consumers are currently shopping for value during their weekend and vacation trips. They have discovered that the cruise is now one of the best values available. In the 1980's, the package tour which includes national public landmarks may also develop as a coveted consumer package. The implications of this development can be both positive and negative. On the positive side, by working with tour companies, public facility managers can schedule off-peak visitation. On the negative side, it means that package tours may continuously advance book the rooms in public hotels and lodges to the exclusion of regional and local inhabitants. In addition, the staff will have to be prepared to direct, handle, and control the package tour groups in a manner that provides a satisfying experience to them and without environmental detriment. As an example, the National Park Service is currently facing the package tour/environmental problem in Glacier Bay National Monument. A conflict exists between shiplines and the Service over a proposed limit to the number of cruise ships to visit the Bay. The Service is setting a maximum of 95 cruise calls in 1980 to protect the feeding habits of the humpback whales (Travel Weekly, March, 1980).

CONCLUSIONS

We are at a critical period in the historical development of leisure, recreation, and travel. Inflation and limited mobility will force evolutionary changes in leisure time life-styles in the next decade. Our society will be slow to accept our national and individual limits on leisure activities. We as planners, managers, and scholars must become more adept at reading the pulse of the population. This may be easier to do than we realize as consumerism, activism, and individualism will be a common phenomena. From the private sector we must learn marketing research.

Continuous change is a part of our society. Recognizing and adopting outdoor recreation programs and budgets will require creativity, imagination, and innovation in a society where changing conditions will accelerate. The demassification of Toffler's Third World will be moderate, but will lead to decentralization and regionalism in governmental programs. Public expenditure for recreation and leisure will be reduced. In some locales society may successfully force an increase in some leisure expenditures and be willing to accept less public services in another area. Pay-as-you-go public recreation will be common by the 1990's.

We will all recreate closer to home, partake more of privately provided recreation services near home, and demand quality services and facilities. The long distance family vacation will become a major event in the family's life cycle. In a way we will return to some of the characteristics of the first Era of Leisure - High Society as only the wealthy will enjoy the mobility abandonment which most of society experienced during Mass Leisure.

In closing, I would like to leave you with some principles of forecasting that include the bitter and the sweet as a reminder not to take ourselves too seriously. The critical factors for successful forecasting are:

1. Identify and publicize the assumptions behind your forecasts - they are all the excuse you will need next year.

2. Long-range forecasts provide more job security than short-range forecasts.

3. If you cannot forecast accurately - forecast often.

4. If you forecast turns out to be correct, never let them forget it.

5. Remember the famous words of wisdom of that Oriental philosopher who said, "He who lives with crystal ball better learn to eat ground glass."

LITERATURE CITED

Baum, H.S. 1977. Toward a post-industrial planning theory. Pol. Sci. 8:401-421.

Fishman, J. A. 1979. Outdoors in the 80's: Acceleration but a shift in direction. N. Y. Times. Dec. 31.

Jennings, L. 1979. Future fun: Tomorrow's sports and games. Futurist. Dec. p. 417-431.

Hoffer, E. 1979. Beware the intellectual. Sat. R. Nov. 24.

Kaczka, E. E. and D. Schleusner 1980. Tourism planning and the use of computer simulation: Nantucket Island, a case study. J. L. Sciences. 3(1):62.

Kahn, H. 1979. Leading futurologist traces next half century in travel. Travel Trade, News Edition, Sect. 1. 96(6). Jan. 31.

Kahn, H. and J. B. Phelps 1979. The economic present and future: A chartbook for the decades ahead. Futurist. June. p. 202-222.

Kennedy, E. 1979. The looming 80's. N. Y. Times Mag. Dec. 2. p. 68-9, and 110-120.

Kopta, K. 1980. Saving the humpback: A tale of conflict between shipping interests and Uncle Sam. Travel Wkly - The Month in Review. Mar. p. 19.

Lazer, W. 1978. The 1980's and beyond: A perspective. ICTA: Marketing for travel agents. p. 49-58.

Levy-Pascal, E. 1979. Will the rising price of energy push us over the cliff? Futurist. Dec. p. 477.

O'Toole, J. 1976. Energy and social change. MIT Press, Boston.

Papson, S. 1979. Tourism - world's biggest industry in the twenty-first century? Futurist. Aug. p. 249-257.

Power, J. E. 1979. The markets of affluence. Resort Mgmt. Dec.

Robinson, I. 1980. Irwin Robinson's viewpoint. Travel Wkly. 39(6).

Sails increase on our big lakes 1980. Mich. Nat. Res. Mag. 49(3):4.

Sutton, H. 1980. 80's traveler: his life and future times. Sat. R. Jan. 5. p. 20-24.

Texas Tourist Development Agency (Newsletter). 1980. 13(7).

The fall and rise of U. S. frugality 1980. Time. Mar. 3. p. 84.

The shrinking standard of living 1980. Bus. W. Jan. 28.

Toffler, A. 1980. The third wave. William Morrow, New York.

Travel and tourism executive newsletter 1980. Feb. 1(9).

Travel market yearbook 1980. 1980. Ziff-Davis Publ. Co., New York.

1980 economic survey of the travel industry. 1980. Travel Wkly. 39(8).

U. S. Department of Commerce, Industry and Trade Adminsitration 1979. The growth of selected leisure industries. U.S. Gov. Print. Off. Washington, D.C.

U. S. Department of the Interior, Heritage Conservation and Recreation Service 1978. 1978 nationwide outdoor recreation plan, task force report. U. S. Gov. Print. Off. Washington, D.C.

U. S. News & World Report 1979. Challenges of the 80's (32 page special selection). U. S. News & World Report, Inc. New York. Oct. 15.

U. S. Travel Data Center and Travel Research Association 1980. Proceedings: 1980 travel outlook forum. Washington, D.C.

U. S. Travel Data Center 1980. Travel printout. Monthly issues Jan. 1974 - April 1980. Washington, D.C.

Waters, S. R. 1980. The big picture, travel 79-80 world trends and markets. ASTA Travel News. New York.

NATIONAL OUTDOOR RECREATION TRENDS SYMPOSIUM REGISTRANTS

APRIL 20-23, 1980

Sherman Adams, President
Loon Mountain Recreation Corp.
Lincoln, NH 03251

Mark Anderson
Motorcycle Industry Council, Inc.
1001 Connecticut Ave., NW
Washington, D.C. 20036

Peter C. Anderson, Vice President
The Bank
Manchester, NH 03105

George Atkinson
Assistant Professor
Recreation & Leisure Studies
Northeastern University
Boston, MA 02115

Wes Bartlett
Associate Economist
Office of Parks & Recreation
Albany, NY 12238

Malcolm I. Bevins
Professor
Agr. & Resource Economics
University of Vermont
Burlington, VT 05401

Glyn Bissix
Coordinator of Outdoor Recreation
Nova Scotia Dept. of Culture,
Recreation and Fitness
Halifax, Nova Scotia B3J2V2

Robert Boston
Forester - Recreation Management
USDA Forest Service
Washington, D.C. 20013

James R. Branch, President
Sno-engineering, Inc.
Box 65
Franconia, NH 03580

Marie-Anne Brochu
Graduate Student
78 York Street
Welland, Ontario

John Brooks
East Lake Road
c/o Malcolm Allen
Homer, NY 13077

Chris Brown, Planner
Appalachian Trail Project
National Park Service
Harpers Ferry, WV 25425

John A. Brown, President
John Brown Associates, Inc.
Boston, MA 02109

Tommy L. Brown, Senior Res. Associate
Dept. of Natural Resources
Cornell University
Ithaca, NY 14853

Warren Brown
Heritage Conservation & Recreation
Service
U.S. Dept. of the Interior
Washington, D.C. 20240

James A. Bunce
Consultant - Michigan Travel Bureau
P.O. Box 30226
Lansing, MI 48906

William Burch
School of Forestry
Yale University
New Haven, CT 06511

Richard L. Bury
Professor, Dept. of Recreation
and Parks
Texas A&M University
College Station, TX 77843

Joseph Cardenuto
Park and Recreation Specialist
Penn State University
University Park, PA 16802

Roger W. Caves
Renewable Resources Planner
85 W. Park Place
Newark, DE 19711

David Chase
Associate Professor of Recreation
267 Rec. Building
University Park, PA 16802

Charles W. Christy
NH Division of Parks
Concord, NH 03301

Thomas Cieslinski
Recreation Planner
Maine Bureau of Parks &
Recreation
Augusta, ME 04333

Gerald L. Cole
Associate Professor
Dept. of Agriculture &
Food Economics
University of Delaware
Newark, DE 19711

Paula Cormier
Mathematical Statistician
Indicators of Outdoor Recreation
Trends
USDA Forest Service
Durham, NH 03824

Thomas M. Corsi
Assistant Professor
College of Business &
Management
University of Maryland
College Park, MD 20742

Rick Curtis, Acting Director
Recreation Planning Branch
Recreation Development Division
Alberta Recreation & Parks
10363 - 108 St.
Edmonton, Alberta
Canada

Hugh C. Davis, Director
The Environmental Institute
University of Massachusetts
Amherst, MA 01054

Chad Dawson, Research Associate
Dept. of Natural Resources
Cornell University
Ithaca, NY 14853

Paul Doherty, Director
Parks and Recreation
Dept. of Resources & Economic
Development
Concord, NH 03301

Ronald Dorsey
Recreation Specialist
Rm. 2340, 18th & C St.
Washington, D.C. 20240

Kent Dover
New Hampshire AAA
Manchester, NH 03101

B. Allen Dunn, Associate Professor
Department of Forestry
Clemson University
Clemson, SC 29631

Herbert E. Echelberger
Research Forester
Indicators of Outdoor Recreation
Trends
USDA Forest Service
P.O. Box 640
Durham, NH 03824

Arlin Epperson
1003 S. Eastwood Circle
Columbia, MO 65201

David L. Erickson
Assistant Professor
Dept. of Forestry
University of Kentucky
Lexington, KY 40546

Craig Evans
Heritage Conservation & Recreation
Service
U.S. Department of the Interior
Washington, D.C. 20243

* Alan Everson
Associate Professor
School of Forestry, Fisheries &
Wildlife
University of Missouri
Columbia, MO 65211

Kurt Fanstill
Supervisor - Planning Unit
Dept. of Natural Resources
Atlanta, GA 30334

Jane M. Farrell
Senior Recreation Planner
161 Franklin Corner Road
Lawrenceville, NJ 08648

James R. Fazio
Department Head
Dept. of Wildland Rec. Management
University of Idaho
Moscow, ID 83843

Roy Feuchter, Director
Recreation Management
USDA Forest Service
Washington, D.C. 20250

* Larry Forcier
Assistant Director
School of Natural Resources
University of Vermont
Burlington, VT 05405

Wayne Freed
Outdoor Recreation Planner
Corps of Engineers
Philadelphia, PA 19106

David T. Funk
Assistant Director for
Research
Northeastern Forest Experiment
Station
USDA Forest Service
Durham, NH 03824

A. H. Gilbert
Associate Professor
University of Vermont
Burlington, VT 05401

Geoffrey Godbey, Professor
Recreation and Parks
Penn State University
University Park, PA 16802

Charles R. Goeldner, Director
Business Research Division
Campus Box 420
University of Colorado
Boulder, CO 80309

Robert Graham
Assistant Professor
Department of Recreation
University of Waterloo
Waterloo, Ontario
Canada N2L3G1

Miklos Gratzer, Professor
SUNY, College of Environmental
Science & Forestry
Syracuse, NY 13210

Robert D. Greenleaf
Assistant Professor
Recreation and Parks Department
University of New Hampshire
Durham, NH 03824

Sheree L. Guthrie
204 Alcan Drive
Pittsburgh, PA 15239

William Hagdorn
Bureau Chief
Comprehensive Planning
Idaho State Parks & Recreation
Department
Boise, ID 83720

Robert J. Halstenrud, Manager
Developmental Syndicated Surveys
A. C. Nielsen Company
Northbrook, IL 60062

George T. Hamilton, President
The Bank
Concord, NH 03301

* G. A. Harrison
Professor of Recreation
Springfield College
Springfield, MA 01109

Milton Harvey
Professor of Geography
Dept. of Geography
Kent State University
Kent, OH 44224

Sherman S. Hasbrouck
Environmental Specialist
Land and Water Resources Center
University of Maine
Orono, ME 04469

Jeffrey M. Hirsch
Owner - Manager
Campers Inn, Inc.
550 Amherst Street
Nashua, NH 03063

Kenneth J. Hock
Associate Professor
Agricultural Economics
West Virginia University
Morgantown, WV 26506

Bob Hoddeson
New Hampshire AAA
Manchester, NH 03101

Kenneth Hornback, Chief
Statistical Office
USDI National Park Service
Denver Service Center
655 Parfet Street
Denver, CO 80225

Roger D. Hubbell, Chief
Office of Outdoor Rec. Services
Bldg (E), 2nd Fl., Fountain Sq.
Columbus, OH 43224

Lloyd Irland, Director
Bureau of Public Lands
Department of Conservation
State House
Augusta, ME 04330

Earl R. Jette
Executive Director
Dartmouth Outing Club
Hanover, NH 03755

William T. Jobe
Executive Vice President
International Snowmobile
Industry Association
Suite 850 South
1800 M St., N.W.
Washington, D.C. 20036

Steven P. Johnson
Associate Director
Minnesota-Wisconsin Boundary
Area Commission
Hudson, WI 54016

Frederick Kacprzynski
Recreation Planner
Federal Building
Laconia, NH 03246

Timothy B. Knopp
Associate Professor
College of Forestry
University of Minnesota
St. Paul, MN 55108

D. M. Knudson
Faculty
Forestry Department
Purdue University
W. Lafayette, IN 47907

A. Robert Koch, Chairman
Dept. of Agricultural Economics
Cook College
Rutgers University
New Brunswick, NJ 08903

Jim Kosuik
Park Ranger/Manager
Corps of Engineers
Franklin, NH 03235

Marvin Kottke, Professor
Dept. of Agricultural Economics
University of Connecticut
Storrs, CT 06268

David A. Kruger
Division Staff Specialist
Dept. of Game, Fish & Parks
Division of Parks & Recreation
Pierre, SD 57501

Fred R. Kuss
Associate Professor
Dept. of Parks & Recreation
University of Maryland
College Park, MD 20740

Roger A. Lancaster
Director of Research
National Recreation and Parks Assn.
1601 Kent Street
Arlington, VA 22209

Wilbur F. LaPage
Social Scientist
Indicators of Outdoor Recreation Trends
USDA Forest Service
P.O. Box 640
Durham, NH 03824

Mike Lazarowich
Assistant Professor
Urban & Regional Planning
University of Waterloo
Waterloo, Ontario

Darrell E. Lewis, Chief
Division of Recreation
Bureau of Land Management
U.S. Department of the Interior
Washington, D.C. 20240

David W. Lime
Research Social Scientist
USDA Forest Service
1992 Folwell Ave.
St. Paul, MN 55108

John J. Lindsay
Associate Professor
School of Natural Resources
University of Vermont
Burlington, VT 05401

David Linton
Supervisory Editor
USDA Forest Service
370 Reed Road
Broomall, PA 19008

James R. Lyons
Program Analyst
Division of Program Plans
U.S. Fish & Wildlife Service
Washington, D.C. 20240

Thomas C. Mack
Marine Recreation Agent
University of Minnesota
Duluth, MN 55801

Marie Magleby, Instructor
Dept. Recreation & Leisure Studies
Northeastern University
Boston, MA 02115

Edward Mahoney
Dept. of Landscape Architecture & Regional Planning
University of Massachusetts
Amherst, MA 01002

* William F. Malcolm
Chief Planner
Sno-engineering, Inc.
Franconia, NH 03580

Robert E. Manning
Assistant Professor
School of Natural Resources
University of Vermont
Burlington, VT 05401

Albert J. Marmo, Chief
Policy Planning & Information Analysis Staff
U.S. Coast Guard
G-BP
2100 Second St., SW
Washington, D.C. 20593

Jay D. Martindale
Resource Planner
Missouri Dept. of Natural Resources
Jefferson City, MO 65101

Bruce Matthews
Extension Specialist
State 4-H Office - UNH
Durham, NH 03824

Gina McLellan
Visiting Assistant Professor
Dept. of Recreation & Park Admin.
Clemson University
Clemson, SC 29631

Robert W. McLellan, Professor
Dept. of Recreation & Park Admin.
Clemson University
Clemson, SC 29631

George H. Moeller
Recreation Research
USDA Forest Service
Washington, D.C. 20250

Weldon J. Montgomery, Unit Leader
Land Use & Recreation
Michigan Dept. of Natural Resources
Forest Management Division
5th Floor Stevens T. Mason Bldg.
Box 30028
Lansing, MI 48909

Tal Morash, Professor
California State University
Northridge, CA 91330

Richard B. Morrison
Associate Professor
Northeastern University
Boston, MA 02115

Karl F. Munson
Graduate Coordinator
University of Maryland
College Park, MD 20740

Floyd L. Newby
Associate Professor
Forest Resources
University of Maine
Orono, ME 04473

Garrell E. Nicholes, President
The People Planners
Salt Lake City, UT 84117

Robert W. Norton, Director
Community Development
Everett, MA 02149

Greta O'Keefe
Midwest Research Institute
Kansas City, MO 64110

Joseph T. O'Leary
Associate Professor
Dept. of Forestry & Natural Res.
Purdue University
W. Lafayette, IN 47907

Robert Olson, Supervisor
Data and Analysis Staff
Recreation Resources Program
Tennessee Valley Authority
Norris, TN 37828

George Orning, Director
Research & Policy Section
Dept. of Natural Resources
Centennial Office Bldg.
St. Paul, MN 55155

Elizabeth Owen
Heritage Conservation and
Recreation Service
U.S. Dept. of the Interior
Washington, D.C. 20243

Earl Patric
Associate Director, RIAES
113 Woodward Hall
University of Rhode Island
Kingston, RI 02881

John Peine
Heritage Conservation and
Recreation Service
U.S. Dept. of the Interior
Ann Arbor, MI 48106

George Peterson, Professor
Northwestern University
Evanston, IL 60204

Steve Peterson
Director of Marketing
P.O. Box 30558
Billings, MT 59101

Robert L. Prausa
Recreation Group Leader
USDA Forest Service
633 W. Wisconsin Ave.
Milwaukee, WI 53203

George Plumb, Chief
Parks & Recreation Services
Forests, Parks & Recreation
Montpelier, VT 05602

Harriet Plumley
Research Landscape Architect
USDA Forest Service
P.O. Box 640
Durham, NH 03824

Linda Profaizer, Publisher
Woodall's Campground Directory
Highland Park, IL 60035

Dennis E. Propst
Outdoor Recreation Planner (ERD)
U.S.A.E. Waterways Exp. Station
P.O. Box 631
Vicksburg, MS 39180

Joseph F. Quinn
NH Division of Parks
Concord, NH 03301

Richard Ragatz, President
Richard L. Ragatz Associates, Inc.
Eugene, OR 97405

Carl Reidel, Director
Environmental Program
University of Vermont
Burlington, VT 05401

Robert W. Reinhardt
Senior Natural Resource Planner
Office of Parks & Recreation
Albany, NY 12238

Dan Ring, Student
Parks & Recreation
Rt. 1, Box 417
Albert Lea, MN 56007

Edward S. Rizzotto
Regional Recreation Resource Specialist
Dept. of Environmental Protection
Middlebury, CT 06762

Kathryn Rottmann
Park Resource Specialist
6 Sheep Pasture Lane
Huntington, NY 11743

Thomas Rumpf
Research Associate
Maine Forest Service
State House
Augusta, ME 04333

David Sanderson
Executive Director
New England Trail Rider Assn.
West Newbury, MA 01985

Vince Scardino
ABT Associates
Cambridge, MA 02138

Donald Schink
Recreation Resources Center
1815 University Ave.
Madison, WI 53706

B. J. Schruender
Multiple Use Planner
Dept. of Conservation
Augusta, ME 04333

Josef Schwalbe
ABT Associates
Cambridge, MA 02138

Mahmood Seyala
Associate Professor
University of District of Columbia
1331 H Street, NW
Washington, D.C. 20005

Noel C. Sheldon
Supervisory Forester
USDA Forest Service
Portsmouth, NH 03801

J. William Shiner
Professor of Parks & Recreation
Dept. of Parks & Recreation
Slippery Rock State College
Slippery Rock, PA 16057

George H. Siehl
Analyst in Environmental Policy
Environmental Policy Division
Congressional Research Service
Library of Congress
Washington, D.C. 20540

Judy Silverberg
NH Division of Parks
Concord, NH 03301

Paul Skydt, Head
Resource Assessment & Management
Alberta Recreation & Parks
10363 - 108 St.
Edmonton, Alberta
Canada

Robert Slagle, Forester
127 Highland Street
Plymouth, NH 03264

Charles K. Smith
Park Planner
Metropolitan Council
St. Paul, MN 55101

Stephen L. J. Smith
Assistant Professor
Dept. of Recreation
University of Waterloo
Waterloo, Ontario

Edward L. Spencer
Chief, Park Planning
Adirondack Park Agency
Ray Brook, NY 12977

Richard W. Stammer
Dept. Agr. Economics & Marketing
Cook College
Rutgers University
New Brunswick, NJ 08903

Barbara D. Steffen
Research Assistant
Box 24136 SW
Washington, D.C. 20024

David R. Stidham
Outdoor Recreation Planner
U.S. Corps of Engineers
Nashville, TN 37072

John M. Stokes
Chief, Lands & Waters
Iowa Conservation Commission
Des Moines, IA 50319

Daniel J. Stynes
Assistant Professor
Dept. of Park & Rec. Resources
Michigan State University
East Lansing, MI 48823

Chris Terry
Outdoor Recreation Planner
Dept. of Natural Resources
Indianapolis, IN 96204

Elizabeth Titus
Planner
Heritage Conservation and Rec. Service
U.S. Dept. of the Interior
Philadelphia, PA 19106

Carlton S. Van Doren
Dept. of Recreation & Parks
Texas A&M University
College Station, TX 77843

Terry Vibeto, Planner
Box 139 - RR 2
Mandan, ND 58554

Donald A. Warman, Leader
Recreation Planning Group
USDA Forest Service
Portland, OR 97208

William S. Warner
Graduate Student, UMO
School of Forest Resources
University of Maine
Orono, ME 04469

Louellen Wasson
Home Economist
County Extension Service
University of Vermont
Essex Jct., VT 05452

Robert G. White
Research Assistant
Dept. of Forestry & Outdoor Rec.
Utah State University
Logan, UT 84322

Bruce Wilkins
Associate Professor
Cornell University
Ithaca, NY 14853

Ralph C. Wilson
Chief Recreation Specialist
Soil Conservation Service
U.S. Department of Agriculture
Washington, D.C. 20013

Thomas J. Wood, Director
Lake Superior Basin Studies Center
University of Minnesota, Duluth
Duluth, MN 55812

Dana Reed Younger
Outdoor Recreation Planner
Heritage Conservation and
Recreation Service
U.S. Dept. of the Interior
Washington, D.C. 20243

Gus Zaso
Associate Professor
Recreation and Parks
University of New Hampshire
Durham, NH 03824

* cancelled

*U.S. GOVERNMENT PRINTING OFFICE: 1981-703-011/23

LaPage, Wilbur F., Chairman
1980. Proceedings 1980 National Outdoor Recreation Trends Symposium. Northeast. For. Exp. Stn., Broomall, Pa. (USDA For. Serv. Gen. Tech. Rep. NE-57)

Proceedings (in two volumes) of a national symposium on recreation trends held at Durham, N.H. on April 20-23, 1980. Volume 1 contains papers on trends in selected recreation activities and in recreation planning, policy, financing, equipment, organizational membership, lands and waters. Volume 2 includes papers on industry sources of trend data, applied trend research, the use of trend data for planning, and trend measurement.

907.2

BEST COPY AVAILABLE

Headquarters of the Northeastern Forest Experiment Station are in Broomall, Pa. Field laboratories and research units are maintained at:

- Amherst, Massachusetts, in cooperation with the University of Massachusetts.
- Beltsville, Maryland.
- Berea, Kentucky, in cooperation with Berea College.
- Burlington, Vermont, in cooperation with the University of Vermont.
- Delaware, Ohio.
- Durham, New Hampshire, in cooperation with the University of New Hampshire.
- Hamden, Connecticut, in cooperation with Yale University.
- Kingston, Pennsylvania.
- Morgantown, West Virginia, in cooperation with West Virginia University, Morgantown.
- Orono, Maine, in cooperation with the University of Maine, Orono.
- Parsons, West Virginia.
- Princeton, West Virginia.
- Syracuse, New York, in cooperation with the State University of New York College of Environmental Sciences and Forestry at Syracuse University, Syracuse.
- University Park, Pennsylvania, in cooperation with the Pennsylvania State University.
- Warren, Pennsylvania.